



MODEL G0519

MILL/DRILL/TAPPING MACHINE

OWNER'S MANUAL



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#CR11258 PRINTED IN CHINA



WARNING!

This manual provides critical safety instructions on the proper setup, operation, maintenance and service of this machine/equipment.

Failure to read, understand and follow the instructions given in this manual may result in serious personal injury, including amputation, electrocution or death.

The owner of this machine/equipment is solely responsible for its safe use. This responsibility includes but is not limited to proper installation in a safe environment, personnel training and usage authorization, proper inspection and maintenance, manual availability and comprehension, application of safety devices, blade/cutter integrity, and the usage of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.



WARNING!

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- **Lead from lead-based paints.**
- **Crystalline silica from bricks, cement and other masonry products.**
- **Arsenic and chromium from chemically-treated lumber.**

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: Work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

Table of Contents

INTRODUCTION	2	SECTION 5: ACCESSORIES	26
Manual Accuracy	2	SECTION 6: MAINTENANCE.....	29
Contact Info.....	2	Schedule	29
Functional Overview	2	Lubrication	29
Identification.....	3	SECTION 7: SERVICE	31
SECTION 1: SAFETY	6	About Service.....	31
Safety Instructions for Machinery	6	Troubleshooting	31
Additional Safety for Mill/Drills	8	Halfnut Adjustment.....	33
SECTION 2: CIRCUIT REQUIREMENTS	9	Gib Adjustment	33
220V 3-Phase Operation	9	SECTION 8: WIRING.....	35
SECTION 3: SET UP	10	Wiring Safety Instructions	35
Setup Safety	10	Wiring Overview.....	36
Items Needed for Setup.....	10	SECTION 9: PARTS	40
Unpacking	10	Headstock Parts Breakdown	40
Inventory	11	Base and Column Parts Breakdown.....	43
Clean Up	11	Labels Breakdown & List	45
Site Considerations.....	12	Notes.....	46
Mounting to Workbench.....	12	WARRANTY AND RETURNS	49
Test Run	13		
Spindle Break-In	14		
SECTION 4: OPERATIONS	15		
Operation Safety	15		
Basic Controls.....	15		
Spindle Height Controls	17		
Spindle Return Spring Tension.....	18		
Drill Chuck.....	18		
R-8 Collets	19		
Headstock Travel	20		
(Z-axis and Rotation)	20		
Table Travel.....	21		
(X-Axis and Y-Axis)	21		
Calculating and Setting Spindle RPM.....	22		
Drilling Speed.....	23		
Tapping Speed and Lubrication Chart.....	24		
Milling/Drilling Mode.....	25		
Tapping Mode	25		

INTRODUCTION

Manual Accuracy

We are proud to offer this manual with your new machine! We've made every effort to be exact with the instructions, specifications, drawings, and photographs of the machine we used when writing this manual. However, sometimes errors do happen and we apologize for them.

Also, owing to our policy of continuous improvement, **your machine may not exactly match the manual**. If you find this to be the case, and the difference between the manual and machine leaves you in doubt, immediately call our technical support for updates or clarification.

For your convenience, we always keep current Grizzly manuals and most updates available on our website at www.grizzly.com. Any updates to your machine will be reflected in these documents as soon as they are complete. Visit our site often to check for the latest updates!

Contact Info

We stand behind our machines. If you have any service questions, parts requests or general questions about the machine, please call or write us at the location listed below.

Grizzly Industrial, Inc.
1203 Lycoming Mall Circle
Muncy, PA 17756
Phone: (570) 546-9663
Fax: (800) 438-5901
E-Mail: techsupport@grizzly.com

If you have any comments regarding this manual, please write to us at the address below:

Grizzly Industrial, Inc.
c/o Technical Documentation Manager
P.O. Box 2069
Bellingham, WA 98227-2069
Email: manuals@grizzly.com

Functional Overview

The Model G0519 has a wayed column that allows for tooling changes without losing tool index or registration. The machine also has a left-and-right tilting headstock and a movable table, which make this machine a versatile metal working machine that can be quickly switched between the drilling/milling and tapping mode.

For drilling operations, the mode switch is turned to the DRILLING position. The spinning drill bit is then lowered into the workpiece by pulling down on the coarse downfeed handles or by turning the fine feed knob. If the headstock is rotated 90° drilling can occur in the X-Axis.

For milling operations, the mode switch is kept in the DRILLING position. Using one or both of the handwheels to control the X and Y movement of the table and workpiece, the workpiece is moved into the spinning cutter. If Z-axis milling is required, the table is fixed, and the spinning cutter is lowered into the workpiece.

For tapping operations, the mode switch is turned to the TAPPING position. The spinning tap is then lowered into a pre-drilled hole in the workpiece to cut threads. When the spindle movement is stopped by the adjustable depth stop, the tapping direction is switched to reverse and the tap automatically backs out of the freshly threaded hole. When the spindle fully returns to the retracted position, the spindle motor shuts off automatically.



Identification

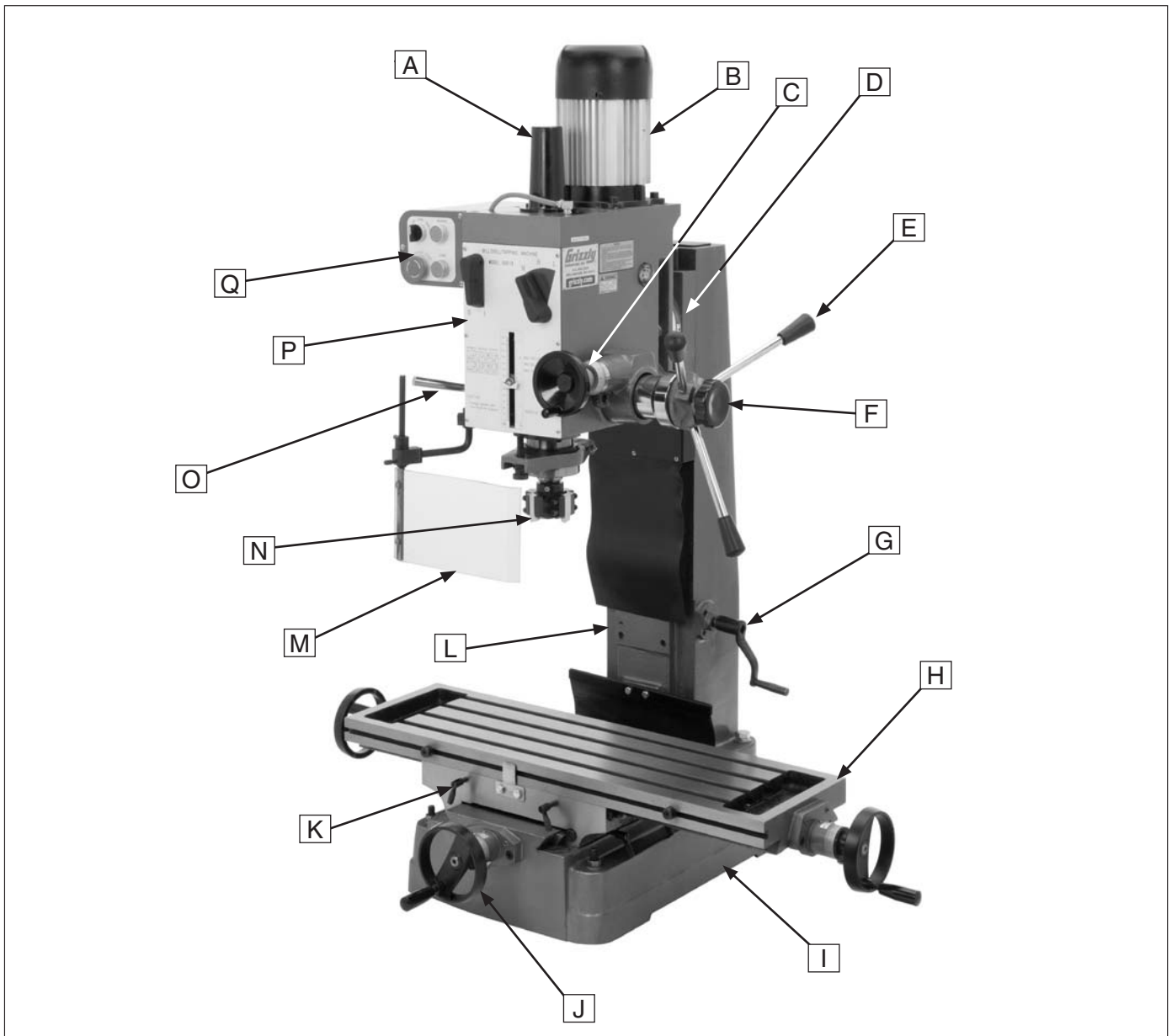


Figure 1. G0519 controls and features.

- | | |
|---|--|
| A. Drawbar Safety Cover | J. Cross (Y-Axis) Handwheel |
| B. Motor 3-Phase 220V 1HP | K. Table Lock |
| C. Fine Feed Spindle Knob | L. Precision Dovetailed Column |
| D. Tilting Head Scale | M. Chip Guard |
| E. Coarse Quill Feed Lever | N. Adjustable Face Milling Head |
| F. Fine Feed Lock Knob | O. Spindle Lock Lever |
| G. Vertical (Z-axis) Hand Crank | P. Oil-Filled Headstock |
| H. Longitudinal (X-Axis) Handwheel | Q. Electrical Control Panel |
| I. Cast-Iron Base | |





MACHINE DATA SHEET

Customer Service #: (570) 546-9663 · To Order Call: (800) 523-4777 · Fax #: (800) 438-5901

MODEL G0519 MILL/DRILL/TAPPING MACHINE

Product Dimensions:

Weight..... 620 lbs.
Length/Width/Height..... 31-1/2 x 46-1/2 x 57 in.
Foot Print (Length/Width)..... 24 x 15-3/4 in.

Shipping Dimensions:

Type..... Wood Crate
Content..... Machine
Weight..... 673 lbs.
Length/Width/Height..... 31 x 35 x 46 in.

Electrical:

Switch..... Push Button/Reversing
Switch Voltage..... 220V
Cord Length..... 10 ft.
Cord Gauge..... 18 gauge
Minimum Circuit Size..... 15 amp
Plug Included..... No
Phase Converter..... G5842, G5844

Motors:

Main

Type..... TEFC Induction
Horsepower..... 1 HP
Voltage..... 220V
Prewired..... 220V
Phase..... Three
Amps..... 4-1/4A
Speed..... 1725 RPM
Cycle..... 60 Hz
Number Of Speeds..... 1
Power Transfer Gear Drive
Bearings..... Shielded, Permanently Lubricated

Main Specifications:

Operation Info

Spindle Travel..... 4-3/4 in.
Swing..... 20-1/2 in.
Longitudinal Table Travel..... 21-5/8 in.
Cross Table Travel..... 7-7/8 in.
Head Travel..... 15-3/4 in.
Head Tilt..... Left and Right 90 deg.
Max. Dist Spindle To Column..... 10-1/4 in.
Max. Dist Spindle To Table..... 20 in.
Drilling Cap For Cast Iron..... 1-5/8 in.
Drilling Cap For Steel..... 1-5/8 in.
No. Of Vert. Spindle Speeds..... 6
Range Of Vert. Spindle Speeds..... 120, 210, 340, 670, 1180, 1970 RPM
Quill Dia..... 3 in.



Table Info

Table Length.....	32-1/4 in.
Table Width.....	9-1/2 in.
Table Thickness.....	1-3/4 in.
No. Of T Slots.....	4
T Slots Width.....	1/2 in.
T Slots Height.....	7/8 in.
T Slots Centers.....	2-1/4 in.
Stud Size.....	3/8 in.

Spindle Info

Spindle Taper.....	R-8
End Milling Cap.....	1-1/8 in.
Face Milling Cap.....	3 in.
Draw Bar Diameter.....	7/16 in.
Draw Bar TPI.....	7/16 - 20
Draw Bar Length.....	16-3/4 in.
Spindle Bearings.....	Ball Bearing

Lead Screw Info

Lead Screw Diameter.....	0.950 in.
Lead Screw TPI.....	10
Lead Screw Length.....	38 in.

Construction

Spindle Housing Const.....	Cast Iron
Table Const.....	Precision Ground Cast Iron
Head Const.....	Cast Iron
Column Const.....	Cast Iron
Base Const.....	Precision Ground Cast Iron
Paint.....	Enamel

Other

Collars Calibrated.....	0.001 in.
Optional Stand.....	G5944
Mobile Base.....	G7314

Other Specifications:

Country Of Origin	China
Warranty	1 Year
Serial Number Location	ID Label on Head Casting
Assembly Time	45 minutes

Features:

Tapping Switch
Auto and Manual Feed Reverse
Eye Shield
Quill Lock
Reversing Switch
Direct Drive



SECTION 1: SAFETY

WARNING

For Your Own Safety, Read Instruction Manual Before Operating this Machine

The purpose of safety symbols is to attract your attention to possible hazardous conditions. This manual uses a series of symbols and signal words which are intended to convey the level of importance of the safety messages. The progression of symbols is described below. Remember that safety messages by themselves do not eliminate danger and are not a substitute for proper accident prevention measures.



Indicates an imminently hazardous situation which, if not avoided, **WILL** result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, **MAY** result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE

This symbol is used to alert the user to useful information about proper operation of the machine.

WARNING

Safety Instructions for Machinery

- 1. READ THROUGH THE ENTIRE MANUAL BEFORE STARTING MACHINERY.** Machinery presents serious injury hazards to untrained users.
- 2. ALWAYS USE ANSI APPROVED SAFETY GLASSES WHEN OPERATING MACHINERY.** Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.
- 3. ALWAYS WEAR AN ANSI APPROVED RESPIRATOR WHEN OPERATING MACHINERY THAT PRODUCES DUST.** Wood dust is a carcinogen and can cause cancer and severe respiratory illnesses.
- 4. ALWAYS USE HEARING PROTECTION WHEN OPERATING MACHINERY.** Machinery noise can cause permanent hearing damage.
- 5. WEAR PROPER APPAREL. DO NOT** wear loose clothing, gloves, neckties, rings, or jewelry which may get caught in moving parts. Wear protective hair covering to contain long hair and wear non-slip footwear.
- 6. NEVER OPERATE MACHINERY WHEN TIRED, OR UNDER THE INFLUENCE OF DRUGS OR ALCOHOL.** Be mentally alert at all times when running machinery.



WARNING

Safety Instructions for Machinery

7. **ONLY ALLOW TRAINED AND PROPERLY SUPERVISED PERSONNEL TO OPERATE MACHINERY.** Make sure operation instructions are safe and clearly understood.
8. **KEEP CHILDREN AND VISITORS AWAY.** Keep all children and visitors a safe distance from the work area.
9. **MAKE WORKSHOP CHILD PROOF.** Use padlocks, master switches, and remove start switch keys.
10. **NEVER LEAVE WHEN MACHINE IS RUNNING.** Turn power **OFF** and allow all moving parts to come to a complete stop before leaving machine unattended.
11. **DO NOT USE IN DANGEROUS ENVIRONMENTS.** DO NOT use machinery in damp, wet locations, or where any flammable or noxious fumes may exist.
12. **KEEP WORK AREA CLEAN AND WELL LIT.** Clutter and dark shadows may cause accidents.
13. **USE A GROUNDED EXTENSION CORD RATED FOR THE MACHINE AMPERAGE.** Undersized cords overheat and lose power. Replace extension cords if they become damaged. DO NOT use extension cords for 220V machinery.
14. **ALWAYS DISCONNECT FROM POWER SOURCE BEFORE SERVICING MACHINERY.** Make sure switch is in OFF position before reconnecting.
15. **MAINTAIN MACHINERY WITH CARE.** Keep blades sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
16. **MAKE SURE GUARDS ARE IN PLACE AND WORK CORRECTLY BEFORE USING MACHINERY.**
17. **REMOVE ADJUSTING KEYS AND WRENCHES.** Make a habit of checking for keys and adjusting wrenches before turning machinery **ON**.
18. **CHECK FOR DAMAGED PARTS BEFORE USING MACHINERY.** Check for binding and alignment of parts, broken parts, part mounting, loose bolts, and any other conditions that may affect machine operation. Repair or replace damaged parts.
19. **USE RECOMMENDED ACCESSORIES.** Refer to the instruction manual for recommended accessories. The use of improper accessories may cause risk of injury.
20. **DO NOT FORCE MACHINERY.** Work at the speed for which the machine or accessory was designed.
21. **SECURE WORKPIECE.** Use clamps or a vise to hold the workpiece when practical. A secured workpiece protects your hands and frees both hands to operate the machine.
22. **DO NOT OVERREACH.** Keep proper footing and balance at all times.
23. **MANY MACHINES WILL EJECT THE WORKPIECE TOWARD THE OPERATOR.** Know and avoid conditions that cause the workpiece to "kickback."
24. **ALWAYS LOCK MOBILE BASES (IF USED) BEFORE OPERATING MACHINERY.**
25. **BE AWARE THAT CERTAIN DUST MAY BE HAZARDOUS** to the respiratory systems of people and animals, especially fine dust. Make sure you know the hazards associated with the type of dust you will be exposed to and always wear a respirator approved for that type of dust.



WARNING

Additional Safety for Mill/Drills

1. **UNDERSTANDING CONTROLS.** Make sure you understand the use and operation of all controls.
2. **SAFETY ACCESSORIES.** Always use a chip guard in addition to your safety glasses when milling to prevent bodily injury.
3. **WORK HOLDING.** Before starting the machine, be certain the workpiece has been properly clamped to the table. **NEVER** hold the workpiece by hand when using the mill.
4. **CHUCK KEY SAFETY.** Always remove your chuck key, drawbar wrench, and any service tools immediately after use.
5. **SPINDLE SPEEDS.** Select the spindle speed that is appropriate for the type of work and material. Allow the mill/drill/tapping machine to gain full speed before beginning a cut.
6. **POWER DISRUPTION.** In the event of a local power outage during use of the mill, turn **OFF** all switches to avoid possible sudden start up once power is restored.
7. **SPINDLE DIRECTION CHANGES.** Never reverse spindle direction when milling, boring, or facing a workpiece.
8. **STOPPING SPINDLE.** **DO NOT** stop the mill/drill/tapping machine using your hand against the chuck.
9. **BE ATTENTIVE.** **DO NOT** leave mill/drill/tapping machine running unattended for any reason.
10. **MACHINE CARE AND MAINTENANCE.** Never operate the mill/drill/tapping machine with damaged or worn parts. Maintain your mill/drill/tapping machine in proper working condition. Perform routine inspections and maintenance promptly. Put away adjustment tools after use.
11. **DISCONNECT POWER.** Make sure the mill is turned **OFF**, disconnected from its power source and all moving parts have come to a complete stop before starting any inspection, adjustment, or maintenance procedure.
12. **AVOIDING ENTANGLEMENT.** Keep loose clothing articles such as sleeves, belts or jewelry items away from the mill spindle. Never wear gloves when operating the machine.
13. **TOOL HOLDING.** Always use the proper tools for the material you are milling. Make sure they are held firmly in the proper tool holder for the job.
14. **CLEAN-UP.** **DO NOT** clear chips by hand. Use a brush or vacuum, and never clear chips while the machine is running.
15. **CUTTING TOOL INSPECTION.** Inspect drills and cutters for sharpness, chips, or cracks before each use. Replace dull, chipped, or cracked cutting tools immediately. Handle new cutting tools with care. Leading edges are very sharp and can cause lacerations.
16. **EXPERIENCING DIFFICULTIES.** If you are experiencing difficulties in setup or operation, stop using the machine! Contact our Technical Support at (570) 546-9663.

WARNING

No list of safety guidelines can be complete. Every shop environment is different. Like all machines there is danger associated with the Model G0519. Accidents are frequently caused by lack of familiarity or failure to pay attention. Use this machine with respect and caution to lessen the possibility of operator injury. If normal safety precautions are overlooked or ignored, serious personal injury may occur.



SECTION 2: CIRCUIT REQUIREMENTS

220V 3-Phase Operation

!WARNING

Serious personal injury could occur if you connect the machine to the power source before you have completed the set up process. **DO NOT** connect the machine to the power source until instructed to do so.

Amperage Draw

The Model G0519 motor draws the following amps under maximum load:

Motor Draw 4.25 Amps

Circuit Recommendations

We recommend connecting your machine to a dedicated and grounded circuit that is rated for the amperage given below. Never replace a circuit breaker on an existing circuit with one of higher amperage without consulting a qualified electrician to ensure compliance with wiring codes. **If you are unsure about the wiring codes in your area or you plan to connect your machine to a shared circuit, consult a qualified electrician.**

Circuit Breaker 15 Amps

Plug/Receptacle Type

Recommended Plug Type NEMA 15-15

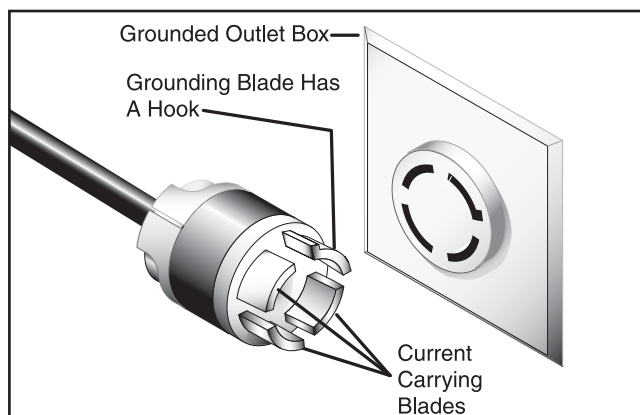
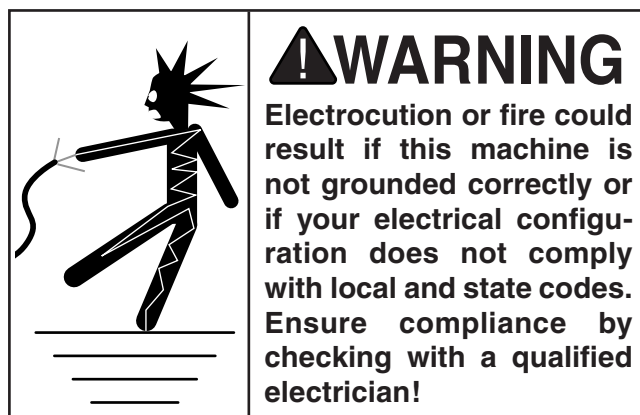


Figure 2. 15-15 Plug & Outlet, 220V, 3-Phase.

!CAUTION

This machine must have a ground prong in the plug to help ensure that it is grounded. **DO NOT** remove ground prong from plug to fit into a two-pronged outlet! If the plug will not fit the outlet, have the proper outlet installed by a qualified electrician.

Extension Cords

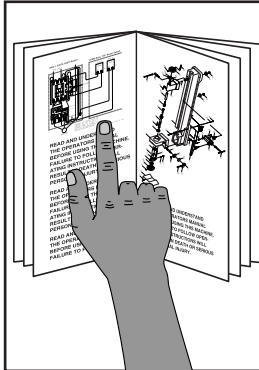
We do not recommend the use of extension cords, if you find it absolutely necessary:

- Use at least a 14 gauge cord that does not exceed 50 feet in length!
- The extension cord must also contain a ground wire and ground lug.
- A qualified electrician **MUST** size cords over 50 feet long to prevent motor damage.



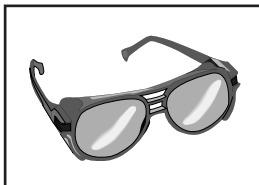
SECTION 3: SET UP

Setup Safety



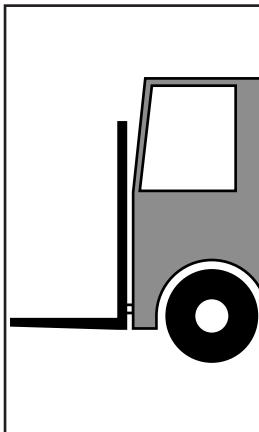
!WARNING

This machine presents serious injury hazards to untrained users. Read through this entire manual to become familiar with the controls and operations before starting the machine!



!WARNING

Wear safety glasses during the entire set up process!



!WARNING

The Model G0519 is a heavy machine. Serious personal injury may occur if safe moving methods are not used. To be safe, get assistance and use power equipment to move the shipping crate and remove the machine from the crate.

Items Needed for Setup

The following items are needed to complete the setup process, but are not included with your machine:

Description	Qty
• Forklift or Hoist (1000 lb. Minimum Rating)	1
• Precision Level	1
• Safety Glasses (for each person).....	1
• Solvent.....	1
• Shop Rags.....	1
• Power Drill	1
• Drill Bit $\frac{9}{16}$ "	1
• Hex Bolts M12-1.75 (length as needed).....	4
• Flat Washers 12mm	8
• Lock Washers 12mm.....	4
• Hex Nuts M12-1.75	4
• An Assistant	1

Unpacking

The Model G0519 was carefully packed when it left our warehouse. If you discover the machine is damaged after you have signed for delivery, *please immediately call Customer Service at (570) 546-9663 for advice.*

Save the containers and all packing materials for possible inspection by the carrier or its agent. *Otherwise, filing a freight claim can be difficult.*

When you are completely satisfied with the condition of your shipment, you should inventory the contents.



Inventory

You should have the following items listed below. In the event that any nonproprietary parts are missing (e.g. a nut or a washer), we would be glad to replace them, or for the sake of expediency, replacements can be obtained at your local hardware store.

Contents (Figures 3 & 4).	Qty
A. Mill/Drill.....	1
B. Feed Levers.....	3
C. Four-Bit Fly Cutter w/Bits	1
D. Hand Crank	1
E. Chuck Key	1
F. JT3 x R8 Arbor	1
G. Drill Chuck 1-16mm JT3	1
H. Hex Wrench Set 4, 5, & 6mm	1 ea
I. Combo Wrench 24mm	1
J. Hand Wheels.....	3
K. Hand Wheel Knobs	3

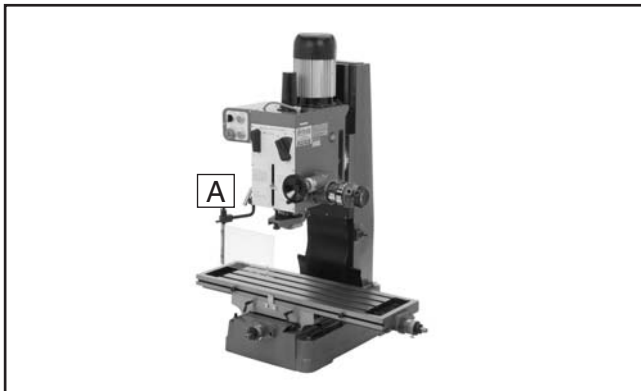


Figure 3. G0519 out of the crate.

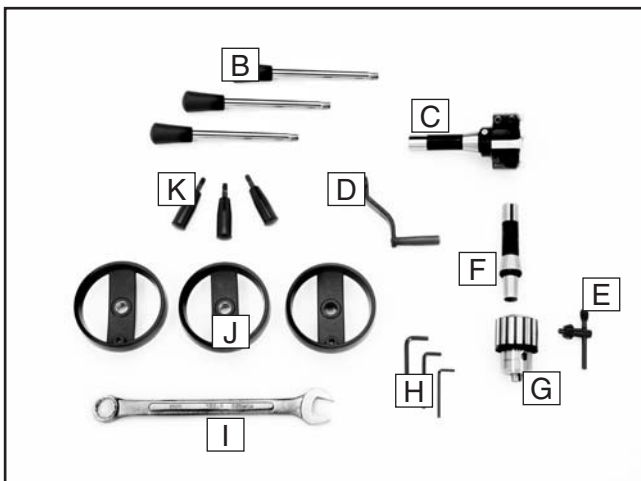
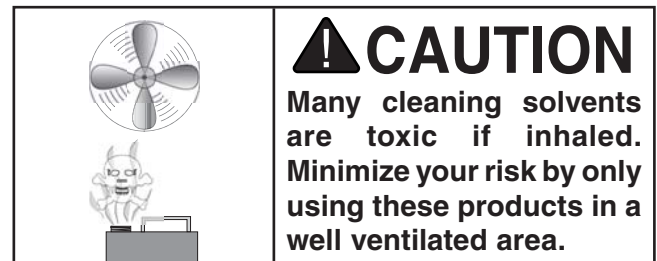


Figure 4. Inventory.

Clean Up

The unpainted surfaces are coated with a waxy oil to prevent corrosion during shipment. Remove this protective coating with a solvent cleaner or degreaser, such as shown in **Figure 5**. For thorough cleaning, some parts must be removed. **For optimum performance, clean all moving parts or sliding contact surfaces.** Avoid chlorine-based solvents, such as acetone or brake parts cleaner that may damage painted surfaces. Always follow the manufacturer's instructions when using any type of cleaning product.



G2544—Solvent Cleaner & Degreaser

H9692—Orange Power Degreaser

Great products for removing shipping grease.



Figure 5. Cleaner/degreasers available from Grizzly.



Site Considerations

Floor Load

Refer to the Machine Data Sheet for the weight and footprint specifications of your machine. Some residential floors may require additional reinforcement to support both the machine and operator.

Placement Location

Consider existing and anticipated needs, size of material to be processed through each machine, and space for auxiliary stands, work tables or other machinery when establishing a location for your new machine. See **Figure 6** for the minimum working clearances.

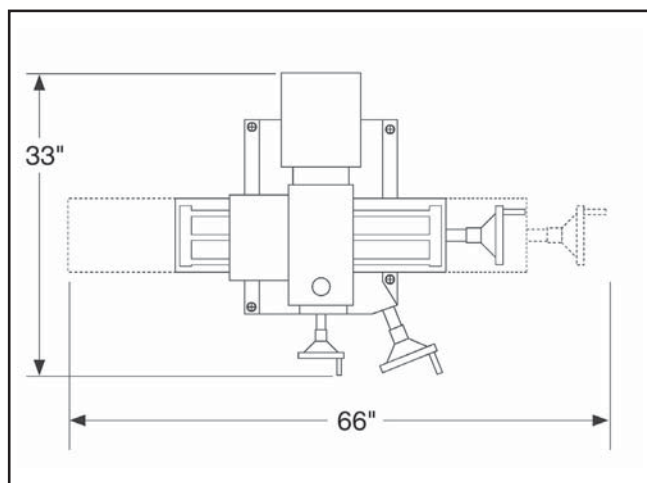
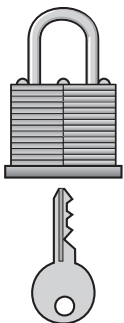


Figure 6. Minimum working clearances.

	⚠ CAUTION Children and visitors may be seriously injured if unsupervised. Lock all entrances to the shop when you are away. DO NOT allow unsupervised children or visitors in your shop at any time!
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Mounting to Workbench

Your mill/drill/tapping machine should be bolted to a workbench to provide maximum rigidity and safety.

To mount the machine to a workbench:

1. Determine the best position for the machine on the workbench.
2. Mark your hole locations using the mounting holes in the base as a guide.
3. Drill the holes needed in the workbench.
4. Place a precision level on the mill/drill/tapping machine table and shim the base until it is level side-to-side and front-to-back.
5. Bolt the machine to the top of the workbench (**Figure 7**).

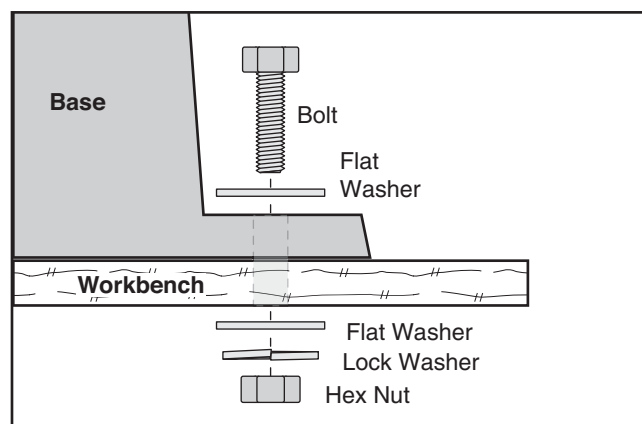


Figure 7. Example of a through mount setup.



Test Run

The test run consists of verifying the following: 1) The motor powers up and runs correctly, 2) the emergency stop button works correctly.

If, during the test run, you cannot easily locate the source of an unusual noise or vibration, stop using the machine immediately, then review **Troubleshooting** on **Page 31**.

If you still cannot remedy a problem, contact our Tech Support at (570) 546-9663 for assistance.

WARNING

Before starting your machine, make sure you have performed the preceding assembly and adjustment instructions, and you have read through the rest of the manual and are familiar with the various functions and safety features on this machine. Failure to follow this warning could result in serious personal injury or even death!

To test run the machine:

1. Make sure you read and understand the safety instructions in this manual and that the machine is setup properly.
2. Shift the spindle speed levers to the spindle speed of 120 RPM. Refer to **Control Panels** on **Page 16** if required.
3. Do all lubrication procedures highlighted in **Lubrication** in **Section 6: MAINTENANCE** on **Page 29**.
4. Make sure all tools and objects used during setup are cleared away from the machine.
5. Connect the machine to the power source.
6. Push the EMERGENCY STOP button in, then twist it clockwise so it pops out. When the OFF button pops out, the switch is reset and the machine is ready for operation (**Figure 8**).



Figure 8. Control panel.

7. Turn the rotary switch to the TAPPING mode and push the START button (**Figure 8**).
 - When operating correctly, the machine runs smoothly with little or no vibration or rubbing noises.
 - Investigate and correct strange or unusual noises or vibrations before operating the machine further. Always stop the machine and disconnect it from power before investigating or correcting potential problems.
8. Pull the rack handle down so the depth stop reads zero. At this point the limit switch will engage and reverse the spindle direction.
9. Press the EMERGENCY STOP button to stop the machine.
 - If the machine stops, the EMERGENCY STOP button safety feature is working correctly.
 - If the machine keeps running, immediately disconnect power to the machine. The EMERGENCY STOP button safety feature is not working correctly. Call Tech Support for help.
 - If all is working fine, but the spindle is rotating in the reverse direction, the motor is wired out of phase. To correct this, disconnect the machine from power and swap positions of any two L1, L2, or L3 power wires.



Spindle Break-In

The machine spindle speed can be set from 120–1970 RPM. You must follow the proper break-in procedures to ensure the spindle bearings and gears break-in and seat before putting any load on the machine.

To break-in the machine:

1. Make sure you read and understand the safety instructions in this manual and that the machine is setup properly.
2. Do all lubrication procedures highlighted in **Lubrication** in **SECTION 6: MAINTENANCE** on **Page 29**.
3. Shift the spindle speed levers to the spindle speed of 120 RPM. Refer to **Control Panels** on **Page 16** if required.
4. Make sure all tools and objects used during setup are cleared away from the machine.
5. Make sure the mode switch (**Figure 9**) is pointing to STOP and connect the machine to the power source.



Figure 9. Electrical control panel.

6. Move the mode switch to DRILLING and push the START button. The spindle will begin to turn at 120 RPM.

7. Let the machine it run for a minimum of 10 minutes.

—If you suspect the machine is not working correctly, shut it **OFF**, disconnect it from power, and use the **Troubleshooting** table on **Page 31** to correct the problem before proceeding further.

—If the mill/drill/tapping machine is running smoothly, proceed to **Step 8**.

NOTICE

DO NOT leave the area while break-in procedure is under way. You must be ready to stop the machine if any problem occurs.

8. Increase the speed to 210 RPM and let it run for another ten minutes. Repeat this run time in each speed selection.
9. Turn the machine **OFF**, set the spindle to rotate in the opposite direction, and then repeat the break-in procedure in all six spindle speed selections.
10. Change the headstock oil immediately while the oil is warm. For details, refer to **Lubrication** in **Section 6: MAINTENANCE** on **Page 29**.

NOTICE

Failure to follow start up and spindle break-in procedures will likely cause rapid deterioration of spindle and other related parts.

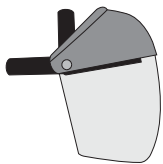


SECTION 4: OPERATIONS

Operation Safety

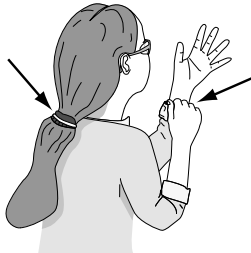
WARNING

Damage to your eyes or lungs could result from using this machine without proper protection. During milling operations, burning metal chips can be ejected from this machine. If cutting fluids are used, fluids can also give off poisonous fumes and smoke during milling operations. Do not use this machine without the proper protective gear. Always wear a face shield and a respirator when operating this machine.



WARNING

Loose hair and clothing could get caught in machinery and cause serious personal injury. Keep loose clothing and long hair away from moving machinery.



NOTICE

If you have never used this type of machine or equipment before, **WE STRONGLY RECOMMEND** that you read books, trade magazines, or get formal training before beginning any projects. Regardless of the content in this section, Grizzly Industrial will not be held liable for accidents caused by lack of training.

Basic Controls

This mill/drill/tapping machine with a left-and-right tilting headstock and a moveable table is a versatile metal working machine that is capable of the following operations:

- Drilling in the X and Z-axes.
- Milling in the X, Y, and Z-axes.
- Tapping in the X and Z-axes.

For drilling operations, the mode switch is turned to the DRILLING position. The spinning drill bit is then lowered in the Z direction into the workpiece by pulling down on the coarse downfeed handles or by turning the fine feed knob. To drill in the Y direction, the headstock is rotated 90° and the table and workpiece are moved into the drill bit using the X-Axis handwheel.

For milling operations, the mode switch is kept in the DRILLING position. Using one or both of the handwheels to control the X and Y movement of the table and workpiece, the workpiece is moved carefully into the spinning cutter. If Z-axis milling is required, the table is fixed, and the spinning cutter is lowered into the workpiece by pulling down on the coarse downfeed handles or by turning the fine feed knob.

For tapping operations, the spindle and table movement are the same as they are for drilling, but the mode switch is now turned to the TAPPING position. Next the maximum tapping depth is then set with the depth stop. The machine is turned on and the spinning tap is then moved into a pre-drilled hole in the workpiece. When the spindle movement is stopped by the depth stop, a limit switch reverses spindle rotation immediately in order to back the tap out of the hole before the tap bottoms out and shears off. When the spindle fully returns to the retracted position, a secondary limit switch shuts the spindle motor off automatically.

Additionally the wayed column allows for tooling changes without losing tool index or registration.



It is vital that you become familiar with the power controls before operating the Model G0519 (Figures 10 and 11).

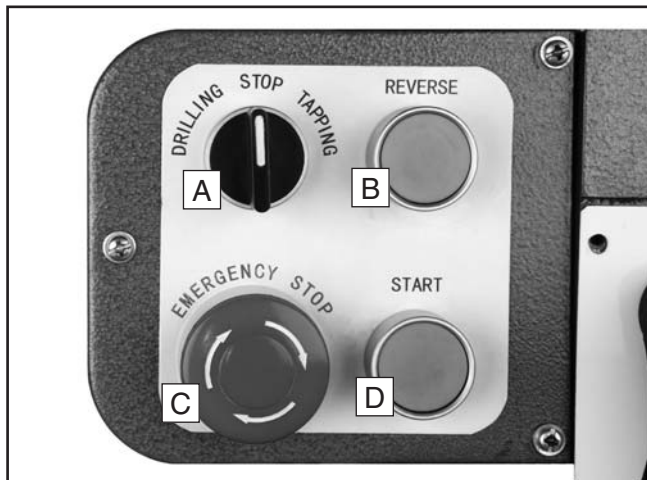


Figure 10. Electrical control panel.

A. Mode Dial: This dial allows you to switch the machine between DRILLING, STOP, and the TAPPING modes explained below:

- DRILLING: In this position, the machine acts as a basic mill/drill without the enhanced features of the automated depth stop. The REVERSE button serves as a jog button in this mode.
- STOP: In this position, the machine is powered up but is in an idle mode.
- TAPPING: In this position, the depth scale will automatically reverse the spindle direction when the spindle reaches the bottom of the stroke.

B. Reverse Buttons: Press this button and spindle rotation will turn counterclockwise. This button serves as a jog button to assist in engaging gears when shifting.

C. EMERGENCY STOP Button: Stops the machine. Rotate the button clockwise until it pops back out to reset it.

D. START Button: Starts the spindle motor if the EMERGENCY STOP button has been reset and the mode dial is in the drilling or tapping position.

E. Range Lever: Selects low range (I), or high range (II) for the speed lever.

F. Speed Lever: Gives three spindle speed selections (M, H, L) in low range, and three spindle speed selections (M, H, L) in high range as selected by the range lever above.

G. Spindle Depth Scale: Shows spindle height in inches and millimeters. When in the "TAPPING mode," if the spindle reaches the bottom of the stroke as shown by the pointer, the internal limit switch reverses spindle rotation and the tap backs out of the hole before snapping off. When the spindle is fully retracted up into the headstock, a secondary limit switch stops the spindle.

When the machine is not in the "DRILLING mode," the spindle depth scale acts as a basic depth scale.

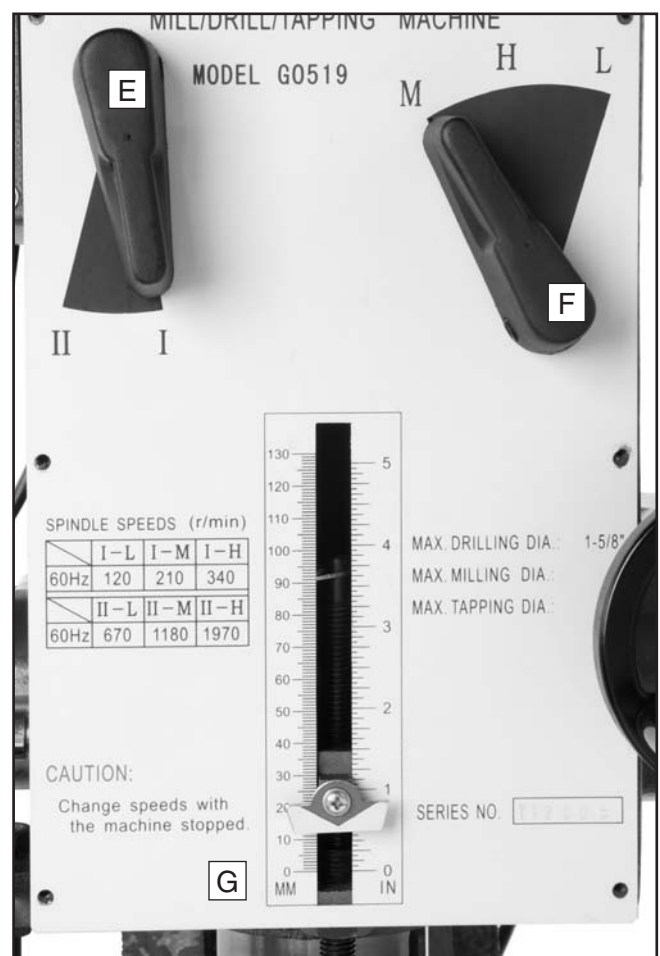


Figure 11. Headstock control panel.



Spindle Height Controls

The spindle height is changed by unlocking the spindle lock lever and using the coarse feed levers or the fine feed knob (**Figure 12**). The spindle height scale indicates the spindle height.

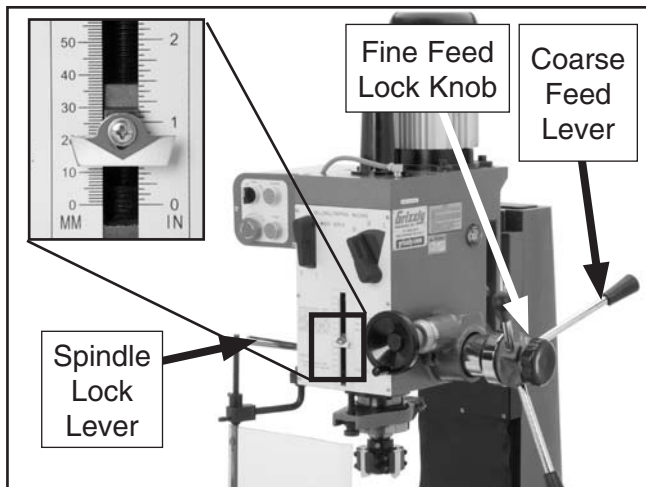


Figure 12. Spindle controls.

Changing spindle position using the coarse feed levers

1. Unlock the spindle lock lever and loosen the fine feed lock knob.
2. Pull down on any of the coarse feed levers to lower or raise the spindle. Observe the scale on the headstock faceplate to monitor movement in inches or millimeters. The maximum range of travel is 4¾".
3. Lock the spindle lock lever to hold the spindle in a particular position if you choose.

Tip: *Milling with the spindle fully extended can cause tool chatter. For maximum spindle rigidity when milling, it is better to keep the spindle retracted into the headstock as far as possible with the spindle lock lever locked, and the fine feed lock knob tightened.*

Changing the spindle position using the fine feed dial

1. Unlock the spindle lock lever and tighten the fine feed lock knob.
2. Rotate the fine feed knob to lower or raise the spindle in small increments. Observe the scale on the knob to monitor movement in thousandths of an inch (**Figure 13**).

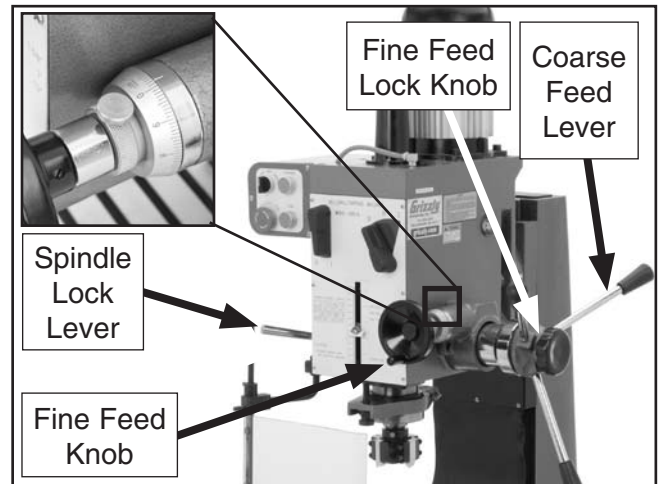


Figure 13. Spindle fine feed controls.

3. Lock the spindle lock lever to hold the spindle in a particular position if you choose.

Tip: *Milling with the spindle fully extended can cause tool chatter. For maximum spindle rigidity when milling, it is better to keep the spindle retracted into the headstock as far as possible with the spindle lock lever locked, and the fine feed lock knob tightened.*



Spindle Return Spring Tension

When tapping some fine threads in soft material, the spindle return spring tension may have to be reduced or eliminated to avoid thread damage.

To change the spindle return spring tension:

1. Put on your safety glasses and leather gloves.
2. While tightly holding the spring cover against the side of the headstock, loosen the lock knob a few turns (**Figure 14**).

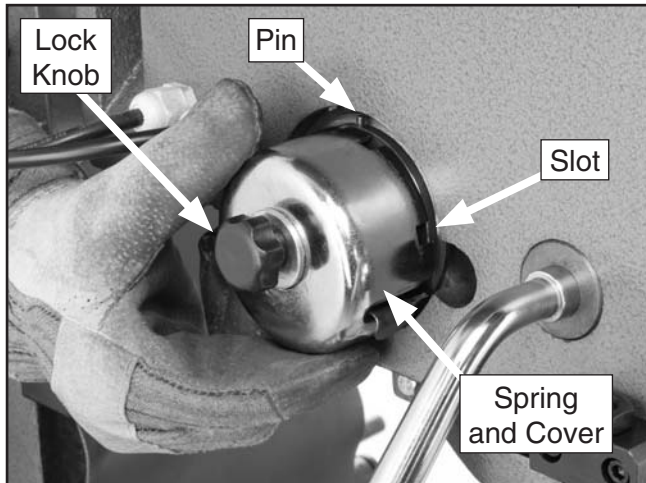


Figure 14. Spindle return spring adjustment.

3. Still holding the spring cover tightly, pull the cover outward just enough to disengage the lock pin from the spring-cover slot.
4. Without losing your grip, allow the cover and spring to unwind one or more slot positions and reengage the new slot with the pin.
5. Tighten the lock knob.

Note: To retighten the spindle return spring, the procedure is the same, but the cover is rotated in the opposite direction.

Drill Chuck

Installation

1. DISCONNECT THE MACHINE FROM POWER!
2. Rotate the drawbar cap counterclockwise, remove the cap (**Figure 15**).



Figure 15. Drawbar and cover.

3. Insert the chuck arbor into the spindle (**Figure 16**), so it engages the alignment pin inside of the spindle and makes contact with the drawbar threads.



Figure 16. Chuck support.

4. Thread the drawbar into the arbor until the arbor seated up into the spindle taper.



5. While supporting the chuck with one hand, snug the drawbar with the 24mm wrench.

Note: *Do not overtighten the drawbar. Overtightening makes arbor removal difficult and will damage the arbor and threads.*

6. Reinstall the drawbar cap.

Removal

1. DISCONNECT THE MACHINE FROM POWER!
2. Remove the safety cap that covers the drawbar.

NOTICE

DO NOT completely unscrew the drawbar before striking it with the hammer. You will damage the threads on the drawbar and the arbor.

3. Using the 24mm wrench, loosen the drawbar one turn only. DO NOT remove it.
4. Tap the top of the drawbar with the hammer. This will unseat the taper of the arbor from the spindle (see **Figure 15**).
5. Hold one hand under the chuck and finish loosening the drawbar by hand until it falls out of the spindle.

Note: *The chuck is attached to the arbor using a JT3 taper. This attachment is considered to be semi-permanent. There should be no need to remove the chuck from the arbor. Inspect the chuck from time to time to make sure it is still tight on the arbor. If it is loose, use a dead-blow or other soft headed hammer to re-seat the taper.*

R-8 Collets

If you do not use the drill chuck and arbor, you need to use a collet to insert the cutting tool into the spindle. Your Model G0519 features an R-8 spindle taper, which gives the freedom to use standard R-8 collets. These optional collets come in many sizes, typically ranging from 1/16" to 7/8" and 3mm to 20mm, and should be matched to your cutting tool shank size.

Installation

1. DISCONNECT THE MACHINE FROM POWER!
2. Unscrew the drawbar cap.
3. Using a clean rag, carefully wipe clean the surface of the collet and spindle taper. Ensure that it is free of debris and is lightly oiled.
4. Insert the cutting tool into the collet, then insert the collet up into the spindle taper.
5. Rotate the collet so it engages the alignment pin inside of the spindle, then slide the collet upward until it makes contact with the drawbar threads.
6. Thread the drawbar into the collet until the collet draws up into the spindle taper.
7. While supporting the tool in the collet with one hand, snug the drawbar with the 24mm wrench in your opposite hand.

Note: *Do not overtighten the drawbar. Overtightening makes collet removal difficult and will damage the drawbar threads, collet, and the spindle taper. Keep in mind that the taper keeps the collet and tool in place. The drawbar simply aids in seating the taper.*



Removal

1. DISCONNECT THE MACHINE FROM POWER!
2. Tighten the spindle lock.



3. Protect the table surface with a piece of cardboard or hold the cutter/tool with a shop towel to prevent it from falling out of the collet.
4. Using the 24mm wrench, loosen the drawbar one turn.



5. Using a hammer, tap on the drawbar to unseat the taper.
6. Unscrew the rest of the drawbar by hand and remove the collet.

Note: When not in use, always remove collets and cutting tools from the spindle taper. Oxidation may cause the collet to seize and make it hard to remove later.

Headstock Travel (Z-axis and Rotation)

The headstock height is adjustable in the vertical Z-axis to accept large workpieces. For unique operations, the headstock can be tilted right or left between 0° and 90°. Your machine has a dovetailed slide that allows you to reposition the headstock and change tooling without losing your alignment with a hole or milling path.

Raising or Lowering the Headstock

1. Unlock the headstock slide lock levers shown in **Figure 17**.

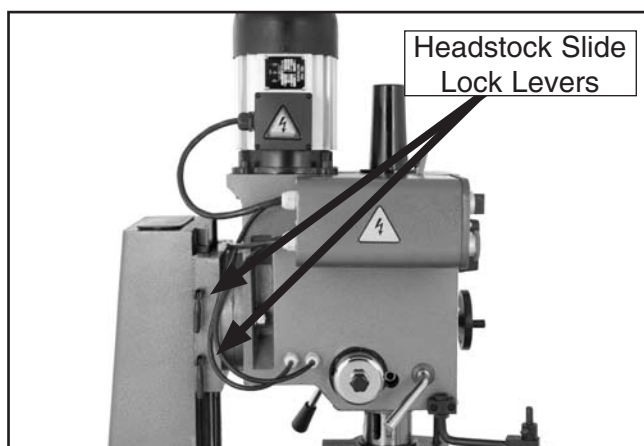


Figure 17. Headstock slide controls.

2. Turn the Z-axis handcrank shown in **Figure 18** to raise or lower the headstock, then lock the headstock slide lock lever.

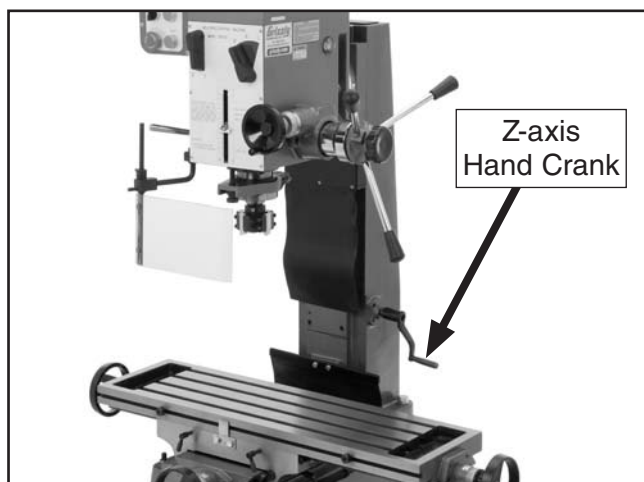


Figure 18. Z-axis control.



Note: For maximum spindle rigidity when milling, keep the spindle retracted into the headstock as far as possible with the spindle lock lever locked and with the fine feed lock knob tightened.

Rotating the Headstock to the Left or Right

1. DISCONNECT THE MACHINE FROM POWER!
2. Using the included 24mm wrench, loosen the three headstock retaining nuts (**Figure 19**).

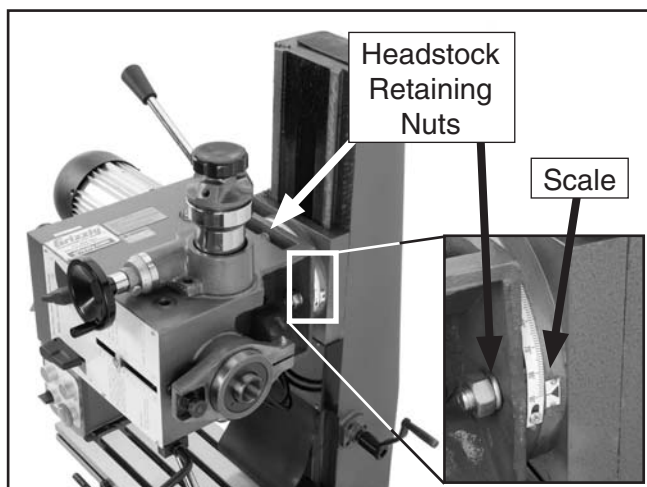


Figure 19. Headstock side tilt.

3. Grasp the headstock firmly, and while watching the tilt scale, rotate the headstock to the required angle.
4. Retighten the three lock nuts that hold the headstock in place.

Table Travel (X-Axis and Y-Axis)

Longitudinal Feed

The longitudinal feed is moved by the X-axis handwheel shown in **Figure 20** at the end of the table. The handwheel will move the table in both directions side-to-side. One complete revolution of the handwheel moves the longitudinal feed 0.100". The longitudinal feed can be locked in position by a table lock located on the front of the table (**Figure 21**).

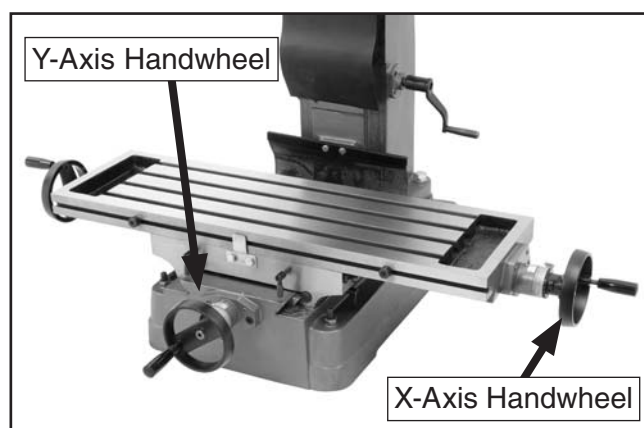


Figure 20. Table X- and Y-axis controls.

Cross Feed

The cross slide in **Figure 20** is moved with the Y-axis handwheel on the front of the table base. One complete revolution of the handwheel moves the cross slide 0.100". The cross slide can be locked into position by table locks located on the right side of the cross slide underneath the table (**Figure 21**).

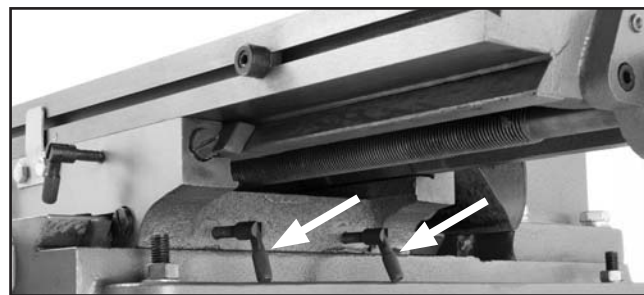


Figure 21. Table locks.

Calculating and Setting Spindle RPM

Closely follow the proper cutting speed and proper feed to reduce undue strain on all moving parts and increase operator safety.

Prior to milling, determine the RPM needed to cut your workpiece, then set the RPM on the machine. Read the example below.

An example of how to determine your needed spindle RPM:

1. Match up the workpiece material with the required cutting speed in the table in **Figure 22**.

— Example:
Alloy Steel = 40 SFM.

2. Measure the diameter of your cutting tool in inches and convert to decimal.

— Example:
HSS $\frac{3}{4}$ " diameter end mill = 0.75 dia.

3. Use the following formula to determine the needed RPM for your operation:

(Cutting Speed x 4) / Tool Diameter = RPM

— Example: $\frac{40 \times 4}{0.75} = 213.3 \text{ RPM}$

4. Move the range lever and speed lever on the headstock (**Figure 23**) to the position that will put the spindle speed closest to your calculated spindle speed of 213.3 RPM.

— Example:
I + M = 210 RPM

Note: When the spindle is fully retracted, the **REVERSE** button serves as a jog button to assist in engaging gears when shifting.

Workpiece Material	Cutting Speed (sfm)
Aluminum & alloys	300
Brass & Bronze	150
Copper	100
Cast Iron, soft	80
Cast Iron, hard	50
Mild Steel	90
Cast Steel	80
Alloy Steel, hard	40
Tool Steel	50
Stainless Steel	60
Titanium	50
Plastics	300-800
Wood	300-500

Note: For carbide cutting tools, double the cutting speed. These values are a guideline only. Refer to the *MACHINERY'S HANDBOOK* for more detailed information.

Figure 22. Cutting speed table for HSS cutting tools.

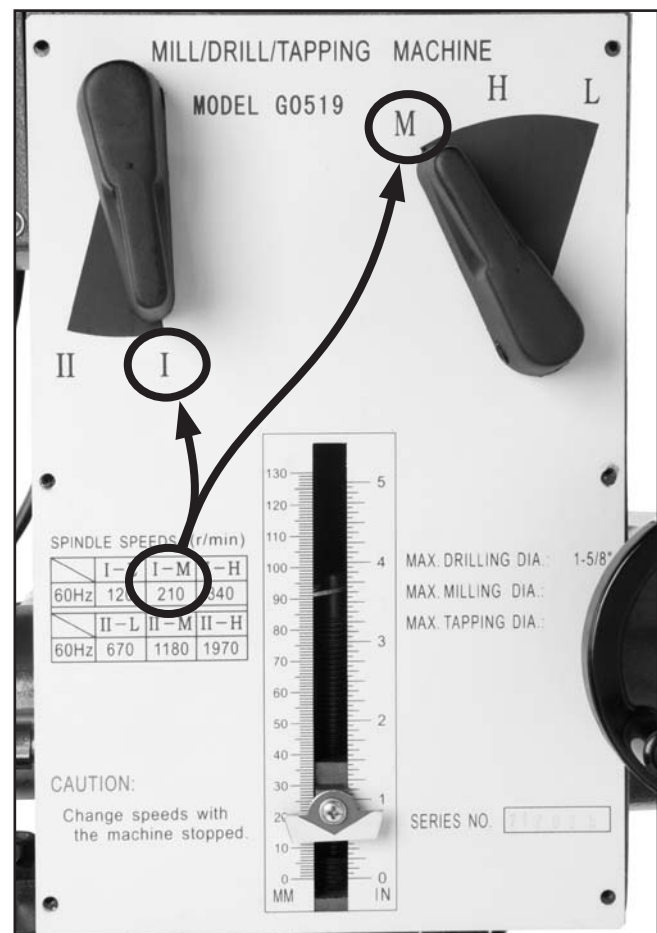


Figure 23. Shifting control panel.



Drilling Speed

Using the Drill Bit Speed Chart

Always follow the manufacturer's speed recommendations if provided with your drill bits, cutters, or hole saws. Exceeding the recommended speeds may be dangerous to the operator.

The chart shown in **Figure 24** is intended as a guide only. The optimum speed will always depend on various factors, including tool diameter, drilling pressure, material hardness, material quality, and desired finish.

Often, when drilling materials other than wood, some type of lubrication is necessary.

Lubrication Suggestions

Wood None
 Plastics Soapy Water
 Brass Water-Based Lubricant
 Aluminum..... Paraffin-Based Lubricant
 Mild Steel..... Oil-Based Lubricant

CAUTION

Larger bits turning at slower speeds tend to grab the workpiece aggressively. This can result in the operator's hand being pulled into the bit or the workpiece being thrown with great force. Always clamp the workpiece to the table to prevent injuries.

Twist/Brad Point Drill Bits	Soft Wood	Hard Wood	Plastic	Brass	Aluminum	Mild Steel
1/16" – 3/16"	3000	2500	2500	2500	3000	2500
13/64" – 3/8"	2000	1500	2000	1250	2500	1250
25/64" – 5/8"	1500	750	1500	750	1500	600
11/16" – 1"	750	500	1000	400	1000	350

Spade/Forstner Bits	Soft Wood	Hard Wood	Plastic	Brass	Aluminum	Mild Steel
1/4" – 1/2"	2000	1500				
9/16" – 1"	1500	1250				
1-1/8" – 1-7/8"	1000	750				
2-3"	500	350				

Hole Saws	Soft Wood	Hard Wood	Plastic	Brass	Aluminum	Mild Steel
1/2" – 7/8"	500	500	600	600	600	500
1" – 1-7/8"	400	400	500	500	500	400
2" – 2-7/8"	300	300	400	400	400	300
3" – 3-7/8"	200	200	300	300	300	200
4" – 5"	100	100	200	200	200	100

Rosette Cutters	Soft Wood	Hard Wood	Plastic	Brass	Aluminum	Mild Steel
Carbide Insert Type	350	250				
One-Piece Type	1800	500				

Tenon/Plug Cutters	Soft Wood	Hard Wood	Plastic	Brass	Aluminum	Mild Steel
3/8" – 1/2"	1200	1000				
5/8" – 1"	800	600				

Figure 24. Drill bit speed chart.

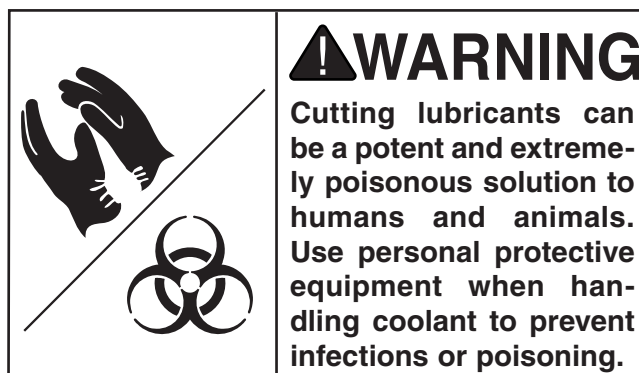


Tapping Speed and Lubrication Chart

Tapping Speed and Lubricant Chart

Always follow the tap manufacturer's speed recommendations. Exceeding the recommended speeds may be dangerous to the operator.

The chart shown in **Figure 25** is intended as a guide only. The optimum speed will always depend on various factors, including tap diameter, threading pressure, material hardness, material quality, and desired finish. Often, when tapping materials different types of lubrication are required as shown below.



Before using the tapping machine you can use the formula and table to find a close spindle speed and suggested lubricant.

$$\text{Spindle RPM} = \frac{\text{Feed Speed (SFM)}}{(0.26 \times \text{Tap Diameter})}$$

Material to be Tapped	Feed Speed (SFM)	Tapping Lubricants
Plastics/Fiberglass	50-70	Dry, Freezing Spray, Liquid Soap
Aluminum	70-90	Soluble Oil
Aluminum Alloys	50-70	Soluble Oil, Light Base Oil, Lard Oil
Brass	60-100	Neat Cutting Oils
Bronze	30-40	
Copper	60-80	
Gun Grade Metal	50-60	Soluble Oil, Light Base Oil, Lard Oil
Grey Cast Iron	30-60	Dry
Malleable Iron	20-40	Soluble Oil, Paraffin-Based Lubricant
Magnesium Alloy	50-70	
Nimonic Alloy	10-12	High Pressure Cutting Oil
Alloy Cast Iron	15-30	Cutting Oils (Sulfur-Based)
Mild Steel	30-50	
Carbon Steel up to 4%	20-40	
Carbon Steel up to 7%	20-30	
Carbon Steel 7% and Higher	15-25	
Steel Alloys 60T	15-25	
Steel Alloys 60T and Higher	10-15	
Stainless Steel	10-20	
Tool Steels	15-25	

Figure 25. Tapping speed and lubricant chart.



Milling/Drilling Mode

Depending on the feed rate, tool type, spindle speed, and the workpiece material this mill/drill/tapping machine has a maximum milling diameter of 3" and maximum drilling diameter of 1 $\frac{5}{8}$ ". The milling table has a coolant trough with a drain for an optional cutting fluid system.

WARNING

Failure to follow RPM and feed rate guidelines may endanger operator safety from ejected parts or broken tools.

To mill a workpiece:

1. Refer to **Basic Controls** on **Page 16**, and learn the how to use the machine controls.
2. Clamp the workpiece to the milling table, and adjust the headstock to the needed height, depth of cut, and milling path.

Tip: *Milling with the spindle fully extended, can cause tool chatter. For maximum spindle rigidity, keep the spindle retracted into the headstock as far as possible with the spindle lock lever locked and the fine feed lock knob tightened.*

3. Refer to **Calculating and Setting Spindle RPM** on **Page 22** to find the best spindle RPM and set the spindle speed.
4. Shift the spindle speed levers to the spindle speed for the appropriate milling speed for the diameter of cutter and type of material to be cut.
5. Put on your safety glasses, turn the mode switch to DRILLING and press START.
6. Use the X-axis or Y-axis handwheels to slowly feed the workpiece into the cutter. If you are only milling in one direction, lock the unused table slide in place.

Tapping Mode

Using this machine in the tapping mode takes some level of skill, so make sure to practice using this feature. When in the tapping mode, this machine is designed to use taps up to 1/2" diameter and to reverse spindle direction when the spindle reaches the bottom of its stroke. If cutting threads in blind holes, pay special attention when setting the maximum tapping depth. If the tap reaches the bottom of the hole before the depth scale reverses spindle direction, the tap will shear off in the hole.

WARNING

Failure to follow RPM and feed rate guidelines may threaten operator safety from ejected parts or broken tools.

To drill and thread a hole:

1. Refer to **Basic Controls** on **Page 16**, and learn the how to use the machine controls.
2. Clamp the workpiece to the milling table, and adjust the headstock to the needed height for drilling and tapping.
3. Set the depth stop and drill your hole with the appropriate speed and drill bit size for the tap. Stop the machine when done.
4. Set the spindle speed to 120 RPM, and readjust the depth stop, so at the bottom of the spindle stroke the depth stop will reverse the spindle before bottoming-out the tap.
5. Put on your safety glasses, install the tap, and turn the mode switch to TAPPING.
6. Apply tapping fluid if needed, press START, and begin threading.

Tip: *If the spindle return spring has too much tension and fights the ability of the tap to draw the spindle down, you can reduce the return spring tension (refer to **Page 18**).*



SECTION 5: ACCESSORIES

H3022—Measurement Tool Set

Includes magnetic base, 1" dial indicator (0.001"), and 6" dial caliper (0.001"). The extremely low price has made this a very popular seller!

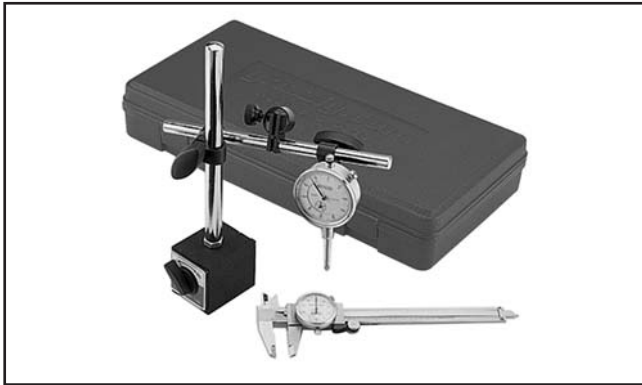


Figure 26. H3022 Measurement Tool Set.

G5971—3½" Swivel Base Milling Vise

G5972—4" Swivel Base Milling Vise

G5973—5" Swivel Base Milling Vise

Vises feature 360° rotation with fine graduations, drop forged handle, precision ground jaw faces, enclosed acme screw and detachable swivel base.



Figure 27. Swivel Base Milling Vise.

G2861—Face Mill

G4051—Carbide Insert for Flycutter

This 2½" Fly Cutter accepts four carbide inserts (not included). Comes with an R-8 arbor.



Figure 28. H2861 Face Mill.

G5562—SLIPIT® 1 Qt. Gel

G5563—SLIPIT® 12 oz Spray

G2871—Boeshield® T-9 12 oz Spray

G2870—Boeshield® T-9 4 oz Spray

H3788—G96® Gun Treatment 12 oz Spray

H3789—G96® Gun Treatment 4.5 oz Spray



Figure 29. Recommended products for protecting unpainted cast iron/steel part on machinery.

Call 1-800-523-4777 To Order



G9322—Boring Head Combo Set

Hardened and ground adjusting screws along with a wide base design guarantee a long life and trouble-free use. Includes a 2" boring head, R-8 arbor with $\frac{7}{16}$ "-20 TPI, and a 12 piece $\frac{3}{4}$ " boring bar set.



Figure 30. G9324 Boring Head Combo Set.

G9760—20-PC. 2 & 4 Flute TiN End Mill Set.

Includes these sizes and styles in two and four flute styles: $\frac{3}{16}$ ", $\frac{1}{4}$ ", $\frac{5}{16}$ ", $\frac{3}{8}$ ", $\frac{7}{16}$ ", $\frac{1}{2}$ ", $\frac{9}{16}$ ", $\frac{5}{8}$ ", $\frac{3}{8}$ ", $\frac{11}{16}$ ", and $\frac{3}{4}$ ".



Figure 31. G9760 20-Pc End Mill Set.

G7160—Machine Mounts

For heavy machine stabilization, these mounts feature fast leveling and vibration reduction. Large rubber foot pads distribute weight and long mounting studs provide a wide range of adjustment.



Figure 32. G7160 Machine Mount.

G1075—52-Pc Clamping Kit.

This superior case-hardened clamping kit is among the best in the world! The T-nut size is $\frac{1}{2}$ " with accompanying $\frac{3}{8}$ "-16 threaded studs.

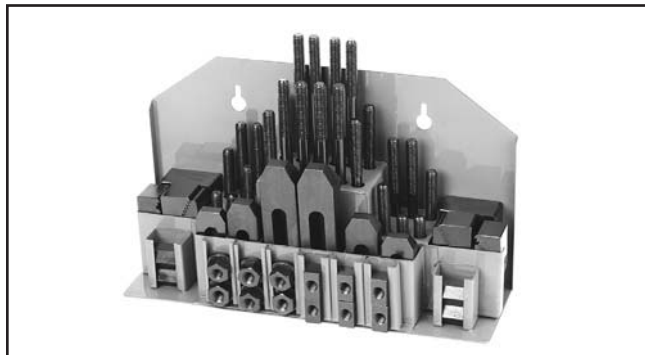


Figure 33. G1075 52-Pc Clamping Kit.

H5685—4" Rotary Table

The perfect rotary table for all you model makers and those doing smaller precision work. Comes with clamping kit.



Figure 34. H5685 4" Rotary Table.

Call 1-800-523-4777 To Order



H5781—Optical Punch Set

This unique tool is indispensable when doing critical layout work. Just look down the magnifying lens and align the cross hairs with the mark on your workpiece. Replace the magnifier with the supplied punch and give it a tap. Includes a bull's eye and cross hair lens, a 150° and 60° center punch and wooden case.



Figure 35. H5781 Optical Punch Set.

H2689—R-8 Quick Change Collet Set

An affordable quick change collet system with ultra precision. These spring collets are hardened and ground to exacting tolerances and offer incredible holding power. This set includes an R-8 arbor and nut, spanner wrench, plastic carrying case and collets sized $\frac{1}{8}$ ", $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ ", $\frac{7}{8}$ ", and 1". What's more, the nut features a self-ejecting rim! A set like this will truly speed up any tool changing process. Drawbar size is $\frac{7}{16}$ " x 20.

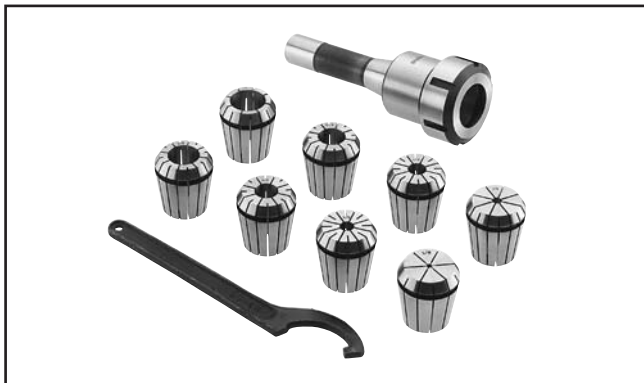


Figure 36. H2689 R-8 Quick Change Collet Set.

H1412—4 oz. Cutting & Tapping Fluid

H1413—16 oz. Cutting & Tapping Fluid

H1414—1 Gallon Cutting & Tapping Fluid

This cutting and tapping fluid is non-ozone depleting and is safe for ferrous and non-ferrous metals with an engineered formula that clings to the cutting tool and provides phenomenal lubrication during cutting and tapping.

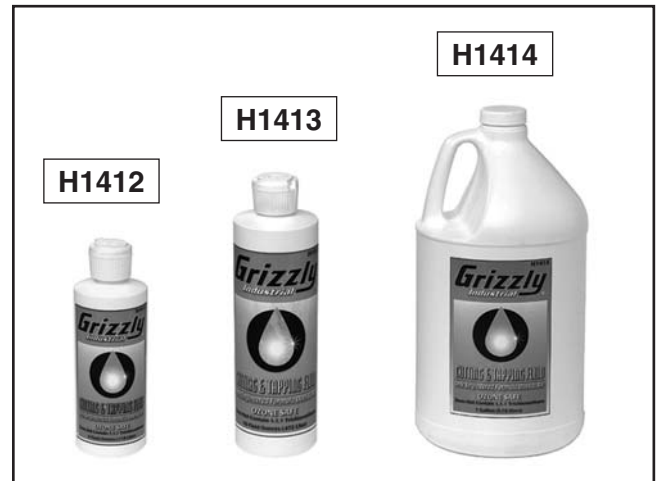


Figure 37. Grizzly® Cutting & Tapping Fluid.

T20640—Machinery's Handbook

For more than 90 years, this handbook has been the benchmark by which machinists' and engineering texts have been judged. Includes a wealth of information on mathematics, mechanics, measurements, and materials. A must have for the amateur or professional.

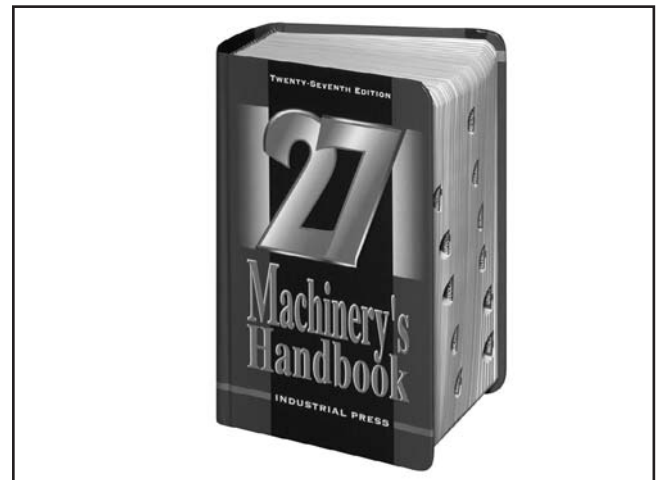
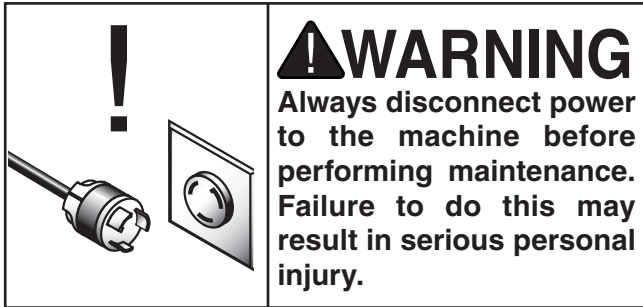


Figure 38. Model T20640 Machinery's Handbook.

Call 1-800-523-4777 To Order



SECTION 6: MAINTENANCE



Schedule

For optimum performance from your machine, follow this maintenance schedule and refer to any specific instructions given in this section.

Daily Check:

- Machine is disconnected from power when not in use.
- Loose mounting bolts.
- Headstock oil level and general lubrication.
- Worn or damaged wires.
- Any other unsafe condition.

Monthly Check:

- Gibs are adjusted properly.

Annual or Biannual Check:

- Lubricate headstock lead screw and gears.

H8257—Primrose Armor Plate with Moly-D Machine and Way Oil 1 Quart

Gives the thinnest oil film possible while providing anti-gumming and anti-chatter lubrication, rust/corrosion protection.



Figure 39. Primrose Armor Plate Lubricant.



Lubrication

General Lubrication

Protect the unpainted cast iron surfaces with regular applications of products like G96® Gun Treatment, SLIPIT®, or Boeshield® T-9.

Tools Needed:

Qty

Tube of White Lithium Grease.....	1
Paint Brush for Grease Application	1
Oil Bottle of General Machine Oil.....	1
Mineral Spirits.....	1 Cup
Rags	As Required

Leadscrew and Gears

1. DISCONNECT MACHINE FROM POWER!
2. Remove the two Phillips head screws (**Figure 40**), and then remove the guard.

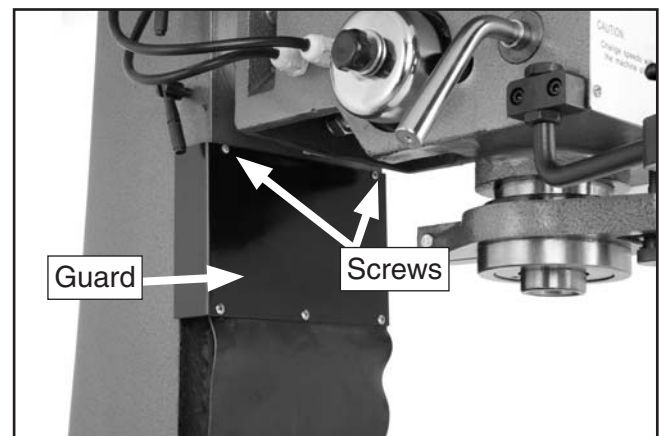


Figure 40. Chip guard.

3. Using mineral spirits, a toothbrush, and rags, thoroughly clean the ways, leadscrew, and gears.
4. Oil the ways with any quality machine oil, and brush the headstock leadscrew and gear teeth with lithium grease.
5. Reinstall the guard assembly on the column.

Rack and Pinion, and Quill

1. DISCONNECT THE MACHINE FROM POWER!
2. Find the exposed rack and pinion at the underside of the headstock (Figure 41).

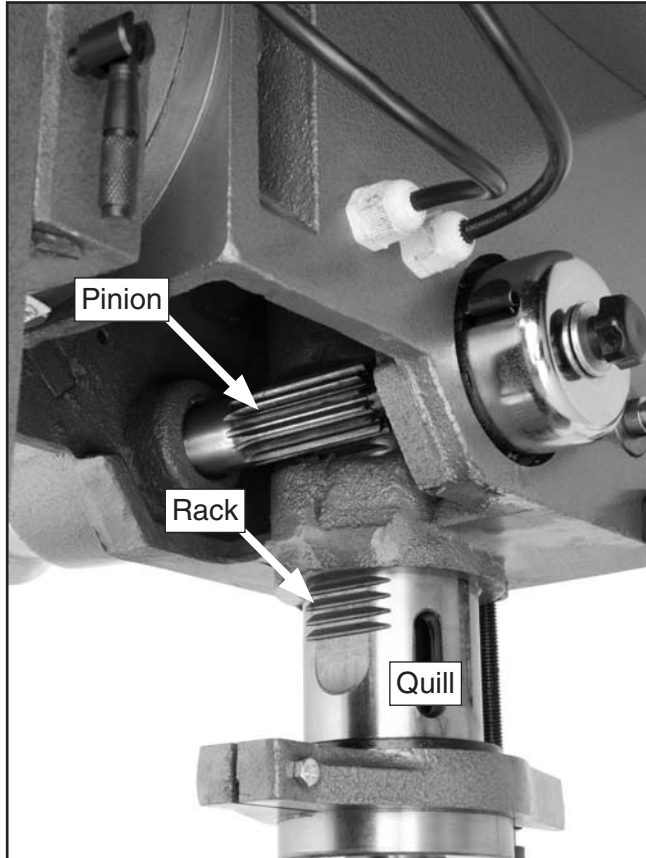


Figure 41. Rack and pinion, and quill.

3. Using mineral spirits, a toothbrush, and rags, thoroughly clean the rack and pinion, and the quill.
4. Oil the quill with any quality machine oil, and brush the rack and pinion gear teeth with lithium grease.
5. Reinstall the guard assembly on the column.

Gearbox

The oil in the gearbox should be changed after break-in, then every 6 months thereafter, depending on usage. We recommend using a lightweight, non-detergent oil. Viscosity can range from 10W through 30W and may include multi-viscosity oil in this same range.

Refer to (Figure 42) for the sight glass and drain plug locations. **Note:** The drain plug location is at the underside of the headstock shown in the detail in Figure 42.

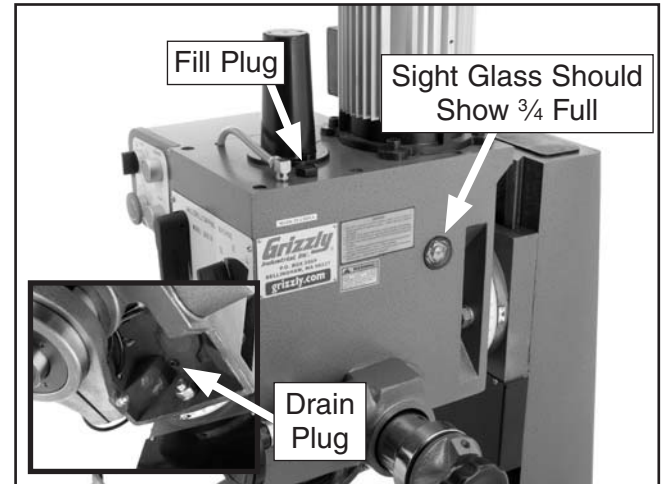


Figure 42. Headstock plug locations.

Hand Wheel Lubrication

Oil the handwheel ball oilers with any light weight, non-detergent oil. Viscosity can range from 10W through 30W and may include multi-viscosity oil in this same range. Refer to (Figure 43) for ball oiler locations.



Figure 43. Table and base ball oiler locations.

Table Ways

Oil the ways (Figure 43) on this machine with any lightweight, non detergent oil. Viscosity can range from 10W through 30W and may include multi-viscosity oil in this same range.

Table Leadscrews

Using mineral spirits, a toothbrush, and rags, thoroughly clean the both table leadscrews, and brush the threads with lithium grease.

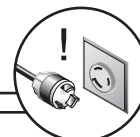


SECTION 7: SERVICE

About Service

Review the troubleshooting and procedures in this section to fix your machine if a problem develops. If you need replacement parts or you are unsure of your repair skills, then feel free to call our Technical Support at (570) 546-9663.

Troubleshooting



Symptom	Possible Cause	Possible Solution
Motor will not start.	1. Emergency stop button is pressed. 2. Main power switch at fault. 3. Blown power supply fuse. 4. Open circuit in motor or loose connections.	1. Reset switch or replace bad switch. 2. Turn dial on, or replace bad switch. 3. Repair short and replace 20A fuse. 4. Inspect circuit boards, wiring connections, plugs, and repair/replace as required.
Motor rotating in wrong direction, or controls working in reverse order.	1. Motor or plug wiring is wired out of phase.	1. Disconnect the machine from power, then swap the positions of any two wires U1, V1, or W1.
Poor surface finishes.	1. Feed rate too fast. 2. Dull cutter. 3. Lock not tightened down. 4. Gibs loose.	1. Slow feed rate. 2. Always use newly sharpened cutters. 3. Tighten column and table locks when possible to maintain rigidity. 4. Adjust gibs (Page 33).
Vibration when running or cutting.	1. Feed rate too high. 2. Loose table. 3. Loose gibs. 4. Loose tooling.	1. Slow feed rate or adjust RPM. 2. Tighten table locks. 3. Adjust gibs (Page 33). 4. Remove tooling, clean mating surfaces and reinstall tooling and drawbar.
Headstock hard to raise.	1. Headstock lock or gib is at fault. 2. Headstock lead screw is binding.	1. Loosen/replace lock lever and adjust gibs (Page 33). 2. Clean and relubricate headstock leadscrew and gears (Page 33).
The quill has excessive deflection.	1. The quill shaft is at fault. 2. The quill and/or bearings are worn.	1. Adjust the quill screw. 2. Replace the quill and/or bearings.
Holes drilled at an incorrect angle.	1. Drill bit installed incorrectly. 2. Headstock and table out of adjustment.	1. Remove drill bit and reinstall. 2. Tram-in table and headstock.



Symptom	Possible Cause	Possible Solution
Table hard to move.	1. Locks are tightened down. 2. Chips have loaded up on the ways. 3. Ways are dry and in need of lubrication. 4. Gibs are too tight.	1. Fully loosen locks needed for movement. 2. Frequently clean away chips that load up during operations. 3. Lubricate ways. 4. Adjust gibs properly (Page 33).
Breaking tooling.	1. Spindle speed/feed rate too fast. 2. Tooling getting too hot. 3. Excessive depth of cut.	1. Use correct spindle RPM and feed rate. 2. Use coolant; reduce spindle RPM/feed rate. 3. Decrease depth of cut and allow chips to clear.
Machine is loud when cutting; overheats or bogs down in the cut.	1. Excessive depth of cut. 2. Dull tooling.	1. Decrease depth of cut and allow chips to clear. 2. Use sharp tooling.
The chuck wobbles or is loose on the spindle shaft.	1. Foreign material is stuck between the chuck-to-spindle mating surface. 2. Damaged chuck.	1. Remove the chuck and clean and de-burr the tapered chuck and spindle mating surfaces, then reassemble. 2. Replace.
The spindle does not retract completely in the uppermost position or it binds.	1. The quill shaft is gummy with sawdust and oil. 2. The feed shaft return spring is weak. 3. The quill deflection screw is binding the quill.	1. Clean the gummy substance with penetrating oil and lubricate with a light coat of oil. 2. Increase the feed shaft return spring tension as described on Page 18. 3. Loosen the jam nut, and slightly turn out the screw where the quill binds. Retighten the jam nut and recheck for binding and looseness at all spindle locations.



Halfnut Adjustment

During the life of your machine, you may have to adjust the lead screw halfnut to remove any backlash that is a result of normal halfnut wear. Do not overtighten the half nuts, or premature wear will occur.

Tools Needed:	Qty
Hex Wrench 4mm.....	1

To adjust the table handwheel backlash:

1. DISCONNECT MACHINE FROM POWER!
2. Using mineral spirits and a clean rag, clean and relubricate the lead screw.
3. Rotate the Y-axis handwheel so the table is positioned to the right and you have access to the lead screw halfnut cap screws (**Figure 44**).

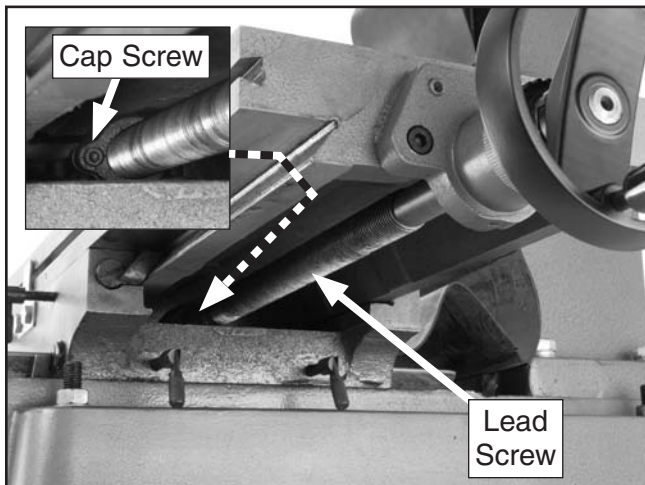


Figure 44. Halfnut adjustment cap screw.

4. Insert a 4mm hex wrench into the halfnut cap screw (**Figure 44**), and tighten or loosen the screw until the handwheel backlash is approximately 0.003" as shown by the dial.

To adjust the headstock gib:

1. DISCONNECT MACHINE FROM POWER!
2. Loosen the headstock lock levers, remove the two Phillips head screws (**Figure 45**) and then remove the guard.
3. Using mineral spirits and a clean rag, clean and relubricate the headstock gib, ways, and the headstock lifting leadscrew.

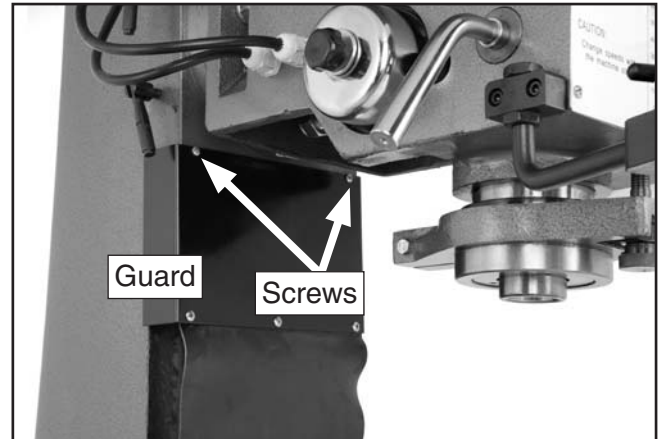


Figure 45. Chip guard.

Gib Adjustment

During the life of your machine, you may have to adjust the gibs to remove any looseness that is a result of normal wear. Do not overtighten the gibs or premature wear will occur.

Tools Needed:	Qty
Flat Tip Screwdriver #3	1

To adjust the table handwheel backlash:

1. DISCONNECT MACHINE FROM POWER!
2. Using mineral spirits and a clean rag, clean and relubricate the lead screw.
3. Rotate the Y-axis handwheel so the table is positioned to the right and you have access to the lead screw half nut capscrews (**Figure 44**).

Continued on next page →



4. Using the screwdriver, adjust the upper and lower gib screws (**Figure 46**) in an alternating manner to adjust the headstock gib.

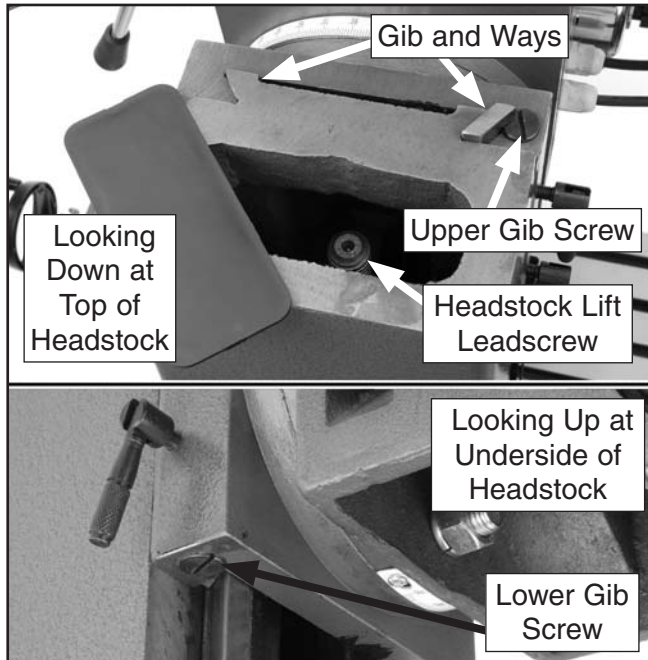


Figure 46. Headstock gib adjustment.

The headstock should slide smoothly with no play or looseness. Do not overtighten the gibs or premature slide and gib wear will occur.

5. Lubricate the headstock way and gib, and reinstall the chip guard.

To adjust the table gibs:

1. DISCONNECT MACHINE FROM POWER!
2. Loosen the X-axis table lock leaf screws.
3. Using mineral spirits and a clean rag, clean and relubricate the table ways, gib, and leadscrew (**Figure 47**).

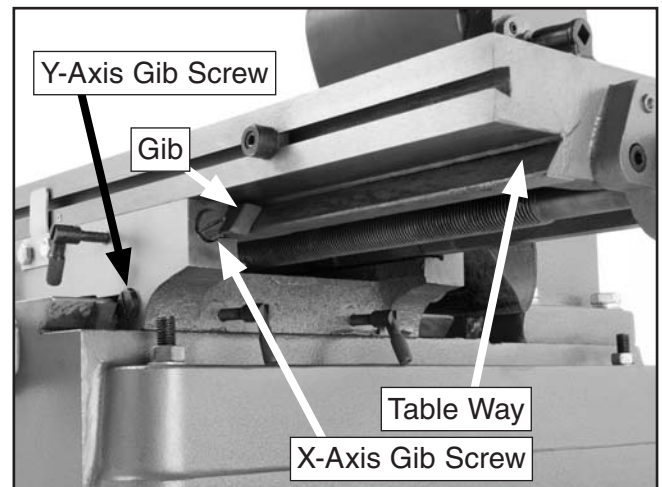


Figure 47. Table gib adjustment.

4. Using a #3 flat tip screwdriver, loosen or tighten the left-hand and right-hand gib screws (**Figure 47**) in an alternating manner to adjust the table gib.
5. When properly adjusted, the table should move in the Y-axis direction with slight resistance as felt in the handwheel.
6. Repeat this procedure on the Y-axis gibs.



SECTION 8: WIRING

These pages are current at the time of printing. However, in the spirit of improvement, we may make changes to the electrical systems of future machines. Study this section carefully. If there are differences between your machine and what is shown in this section, call Technical Support at (570) 546-9663 for assistance BEFORE making any changes to the wiring on your machine.

WARNING

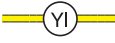
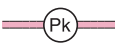
Wiring Safety Instructions

- 1. SHOCK HAZARD.** Working on wiring that is connected to a power source is extremely dangerous. Touching electrified parts will result in personal injury including but not limited to severe burns, electrocution, or death. Disconnect the power from the machine before servicing electrical components!
- 2. QUALIFIED ELECTRICIAN.** Due to the inherent hazards of electricity, only a qualified electrician should perform wiring tasks on this machine. If you are not a qualified electrician, get help from one before attempting any kind of wiring job.
- 3. WIRE CONNECTIONS.** All connections must be tight to prevent wires from loosening during machine operation. Double-check all wires disconnected or connected during any wiring task to ensure tight connections.
- 4. MODIFICATIONS.** Using aftermarket parts or modifying the wiring beyond what is shown in the diagram may lead to unpredictable results, including serious injury or fire.
- 5. MOTOR WIRING.** The motor wiring shown in these diagrams is current at the time of printing, but it may not match your machine. Always use the wiring diagram inside the motor junction box.
- 6. WIRE/COMPONENT DAMAGE.** Damaged wires or components increase the risk of serious personal injury, fire, or machine damage. If you notice that any wires or components are damaged while performing a wiring task, replace those wires or components before completing the task.
- 7. CIRCUIT REQUIREMENTS.** You MUST follow the requirements on **Page 9** when connecting your machine to a power source.
- 8. EXPERIENCING DIFFICULTIES.** If you are experiencing difficulties understanding the information included in this section, contact our Technical Support at (570) 546-9663.

NOTICE

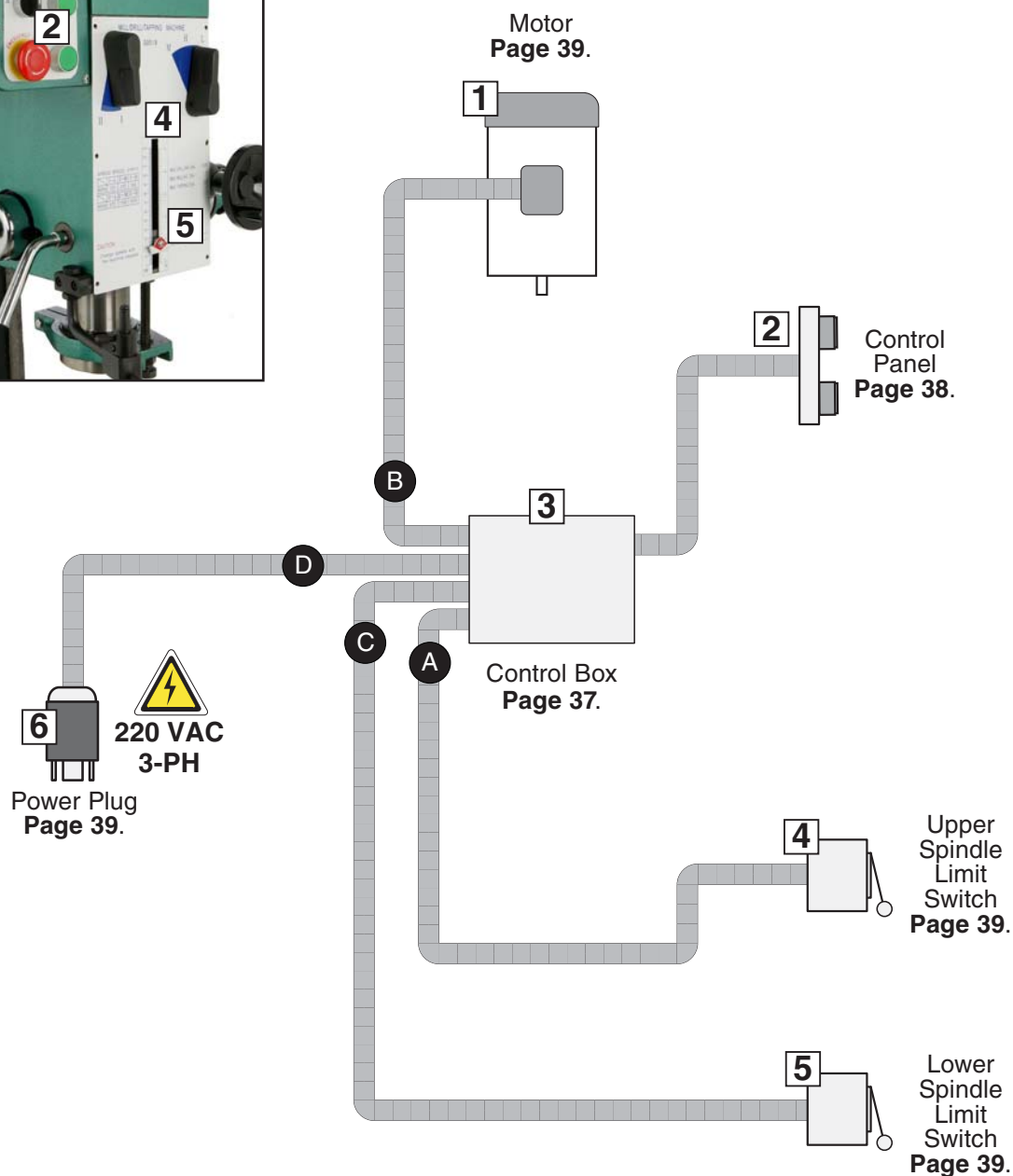
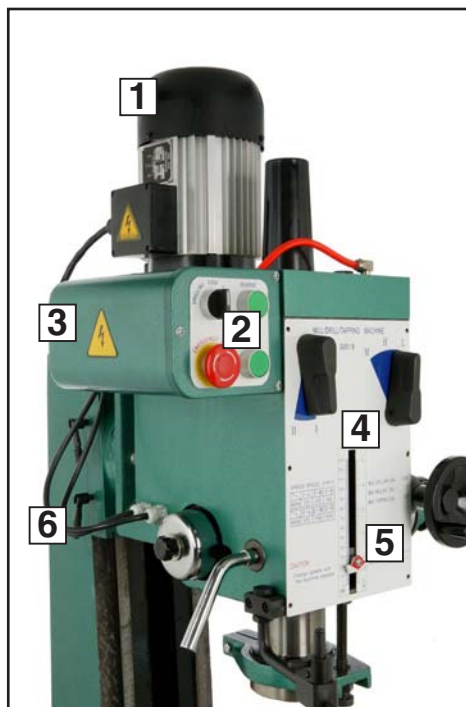
The photos and diagrams included in this section are best viewed in color. You can view these pages in color at www.grizzly.com.

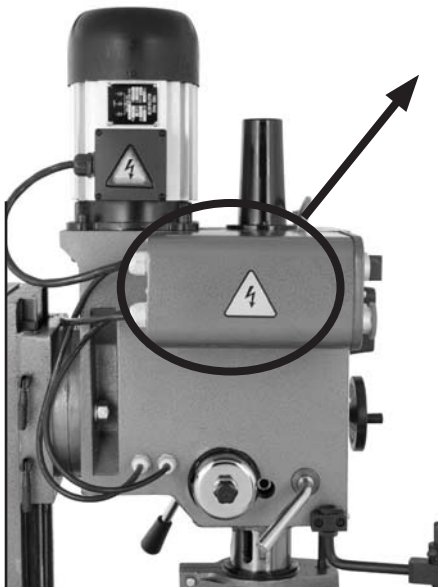
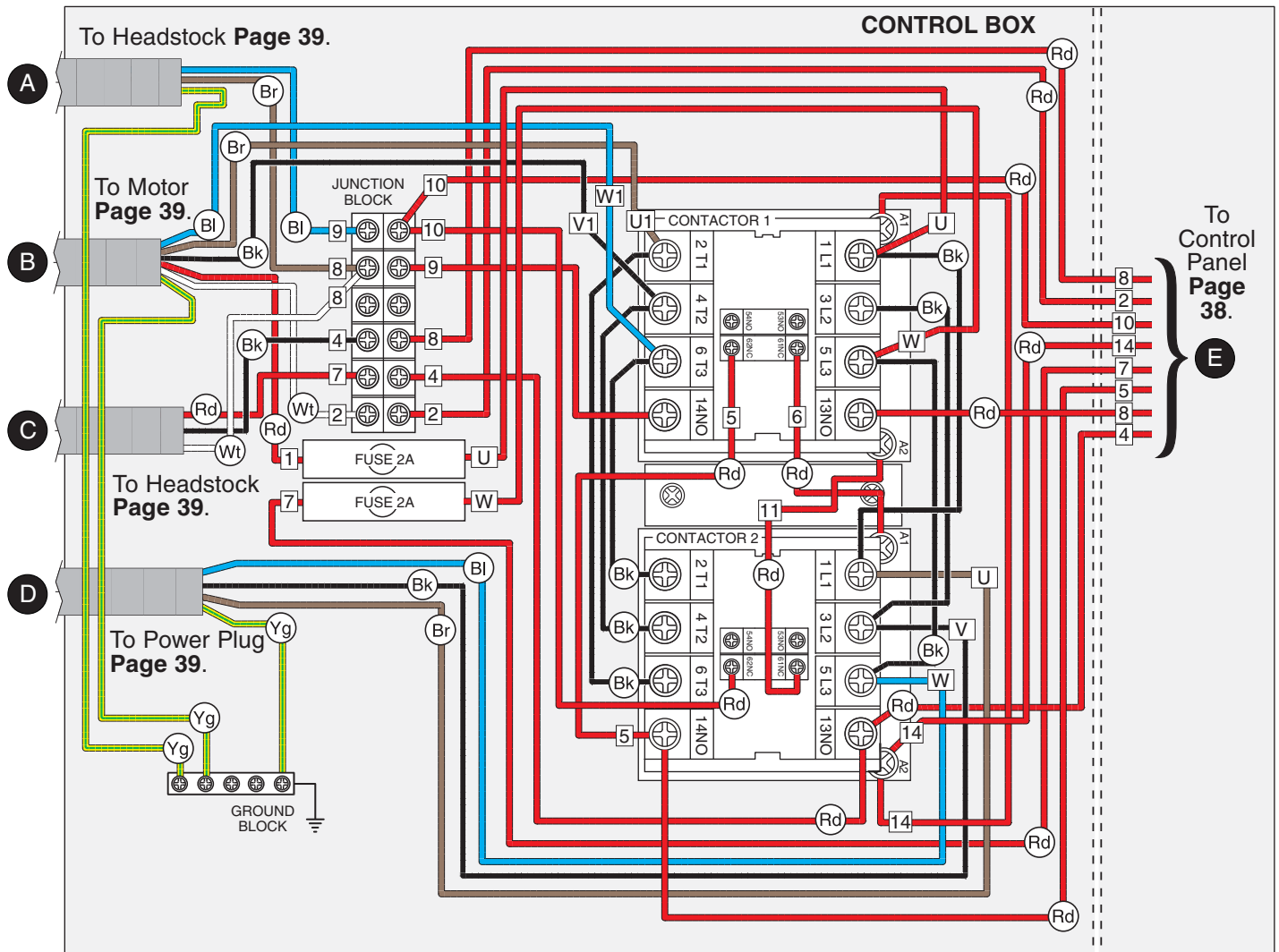
COLOR KEY

BLACK		BLUE		YELLOW		LIGHT BLUE	
WHITE		BROWN		YELLOW GREEN		BLUE WHITE	
GREEN		GRAY		PURPLE		TURQUOISE	
RED		ORANGE		PINK			



Wiring Overview





G0519 Mill/Drill/Tapping Machine

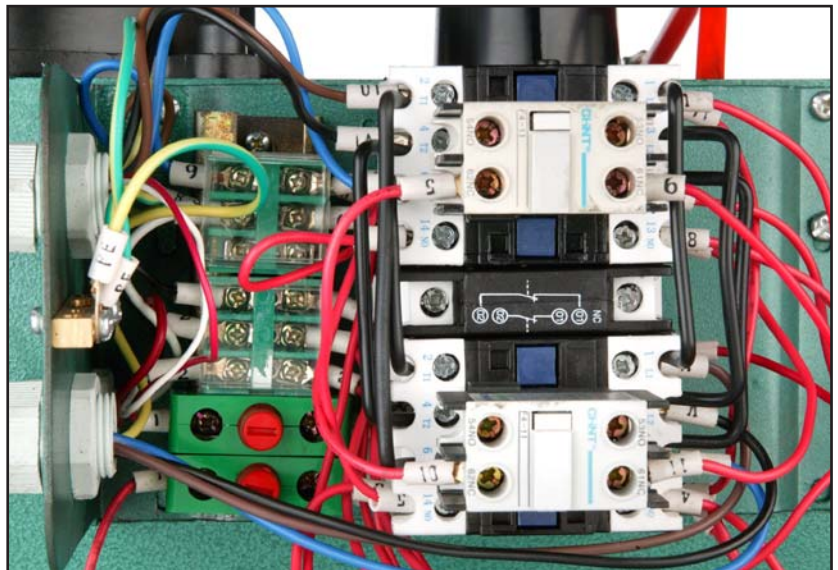


Figure 48. Main control box.



**READ ELECTRICAL SAFETY
ON PAGE 35!**



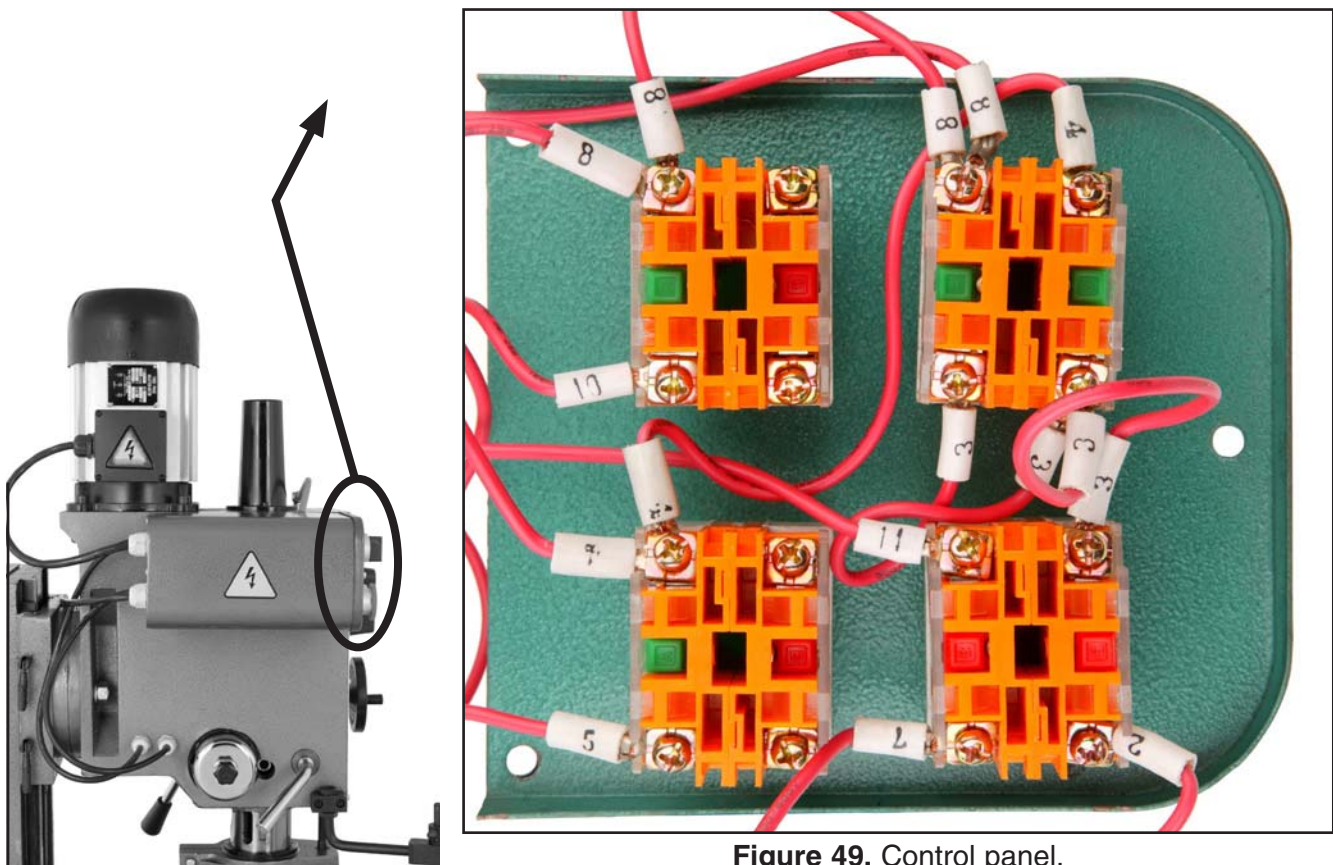
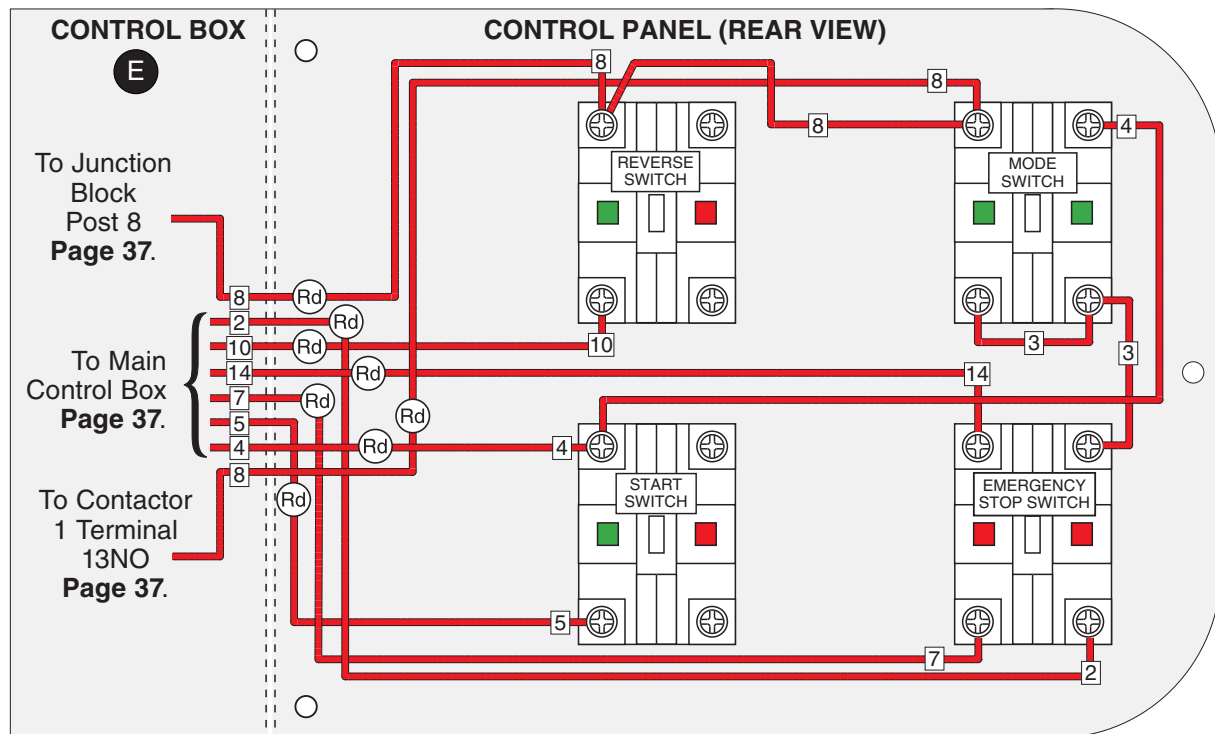
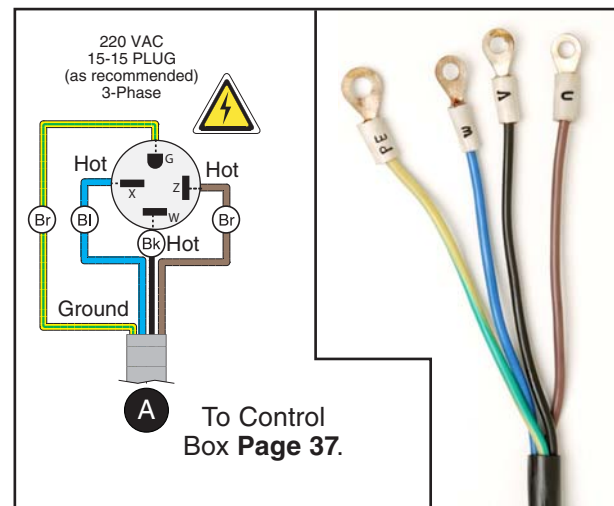
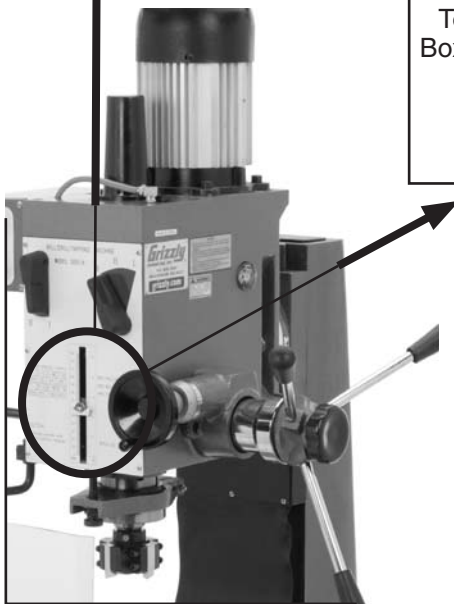
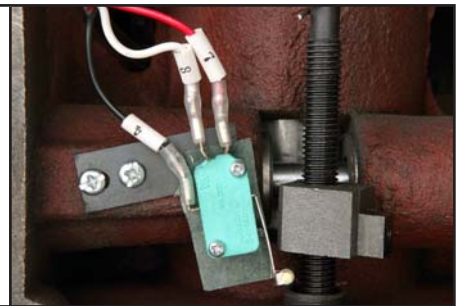
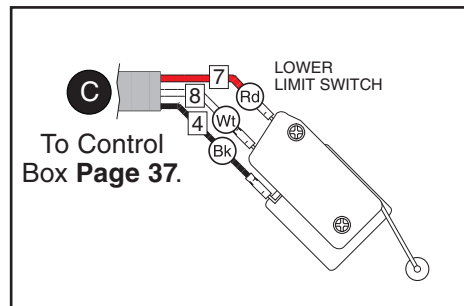
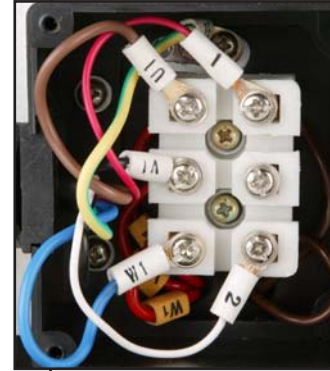
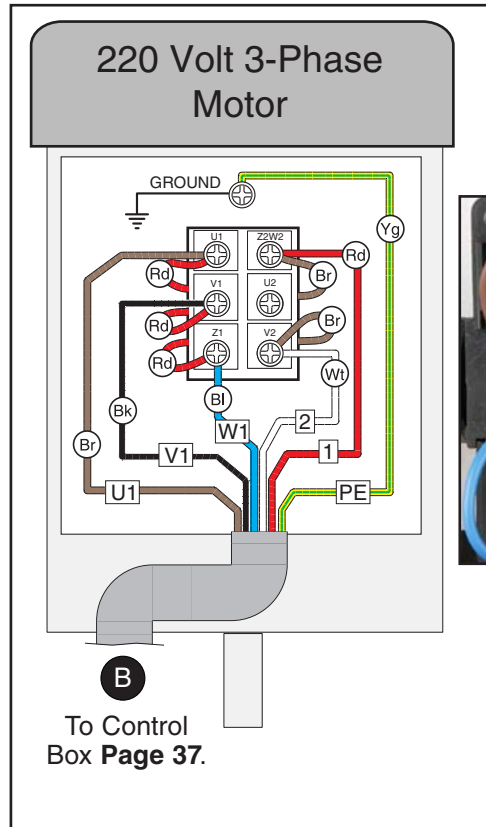
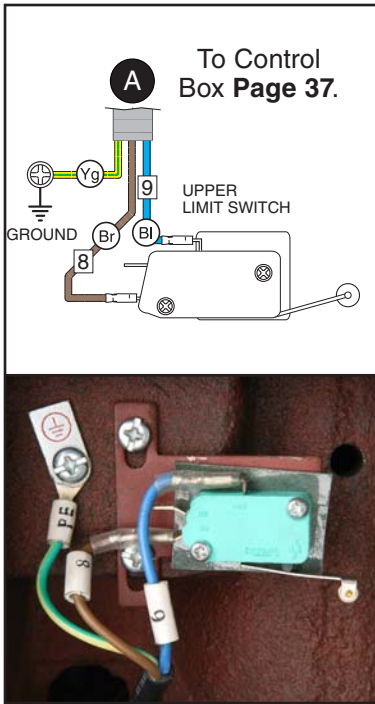


Figure 49. Control panel.



Headstock Parts Breakdown



REF	PART #	DESCRIPTION
1	P0519001	SPANNER NUT M30-1.5
2	P0519002	TANG WASHER 30
3	P0519003	TAPERED ROLLER BEARING 30206/P5
3-1	P0519003-1	RUBBER BUMPER
4	P0519004	QUILL
5	P0519005	SCALE BLOCK
6	P0519006	POINTER
7	PS17M	PHLP HD SCR M4-.7 x 6
8	P0519008	COTTER PIN 2 X 15MM
9	P0519009	STUD ROD
10	P0519010	BASE
11	PN01M	HEX NUT M6-1
12	PW03M	FLAT WASHER 6MM
13	PSB37M	CAP SCREW M6-1 X 50
14	PN13M	HEX NUT M16-2
15	P0519015	SUPPORT
16	PRP64M	ROLL PIN 3 X 18
17	PSW03-1	KNOB
18	P0519018	TAPERED ROLLER BEARING 32008/P5
19	P0519019	BEARING CUP
20	P0519020	SPINDLE
21	P0519021	COMPLETE ELECTRIC BOX ASSEMBLY
21-1	P0519021-1	COMPLETE TAP/MILL SWITCH
21-2	P0519021-2	TAP/MILL SWITCH KNOB
21-3	P0519021-3	REVERSE SWITCH
21-4	P0519021-4	POWER LIGHT LENS
21-5	P0519021-5	STOP SWITCH
21-6	P0519021-6	START SWITCH
22	PSS20M	SET SCREW M8-1.25 X 8
23	P0519023	SPEED LEVER
24	P0519024	HEADSTOCK PANEL PLATE
25	P0519025	OIL SEAL
26	PR03M	EXT RETAINING RING 12MM
27	P0519027	LEVER SHAFT (LEFT)
28	P0519028	LEVER (LEFT)
29	PSS04M	SET SCREW M6-1 X 12
30	PN01M	HEX NUT M6-1
31	PRP18M	ROLL PIN 4 X 12
32	P0519032	LEVER BRACKET
33	P0519033	LEVER SHAFT (RIGHT)
34	P0519034	LEVER (RIGHT)
35	P0519035	DOWEL PIN
36	PSB17M	CAP SCREW M4-.7 X 10
37	P0519037	PINION SHAFT
38	P0519038	KEY 8 X 7 X 32
39	P0519039	FEED COVER
40	P6202	BALL BEARING 6202ZZ
41	P0519041	SPACER
42	P0519042	WORM SHAFT
43	P0519043	WORM COVER
44	PB148M	HEX BOLT M5-.8 X 16
45	PSB33M	CAP SCREW M5-.8 X 12
46	P0519046	SCALE PLATE
47	P0519047	HANDWHEEL

REF	PART #	DESCRIPTION
47-1	PSB03M	CAP SCREW M5-.8 X 8
48	PB07M	HEX BOLT M8-1.25 X 25
49	P0519049	WORM GEAR
50	P0519050	COMPRESSION SPRING
51	P0519051	HANDLE ROD
52	P0519052	HANDLE BALL
53	P0519053	HANDLE BODY
54	PSW03-1	KNOB
55	P0519055	FIXED COLLAR
56	P0519056	OIL PLUG
57	P0519057	SIGHT GLASS
58	P0519058	HEADSTOCK CASTING
59	P0519059	FIXED NUT M20-1.5
60	P0519060	FIXED COLLAR
61	P0519061	HANDLE
62	PN02M	HEX NUT M10-1.5
63	PB14M	SPECIAL SET SCREW M10-1.5 X 35
64	PRP44M	ROLL PIN 3 X 10
65	P0519065	SPRING BASE
66	PSB33M	CAP SCREW M5-.8 X 12
67	P0519067	COIL SPRING
68	P0519068	SPRING CAP
69	PW03M	FLAT WASHER 6MM
70	PLW03M	FENDER WASHER 9MM
71	PSW03-1	KNOB
72	P0519072	GASKET
73	P0519073	FLANGE
74	PLW01M	LOCK WASHER 5MM
75	PSB03M	CAP SCREW M5-.8 X 8
76	P0519076	OIL SEAL
77	P0519077	GEAR T-25
78	PK147M	KEY 6 X 6 X 18
79	P0519079	GEAR T-53
80	P51103	THRUST BEARING 51103
81	P0519081	COVER BASE
82	P0519082	COVER
82-1	P0519082-1	DRAWBAR 7/16-20 X 15-3/4
83	P0519083	CAP
84	PR21M	INT RETAINING RING 35MM
85	P6003	BALL BEARING 6003ZZ
86	P0519086	COMBO GEAR T-16/T-43
87	PK36M	KEY 5 X 5 X 50
88	P0519088	STEEL BALL
89	P0519089	COMPRESSION SPRING
90	P0519090	KEY 6 X 6 X 75
91	P0519091	SHAFT III
92	P0519092	GEAR 32
93	P0519093	GEAR 18
94	P0519094	GEAR 25
95	PR09M	EXT RETAINING RING 20MM
96	P0519096	GEAR T-41
97	PK101M	KEY 6 X 6 X 14
98	P0519098	KEY 5 X 5 X 60
99	P0519099	SHAFT II

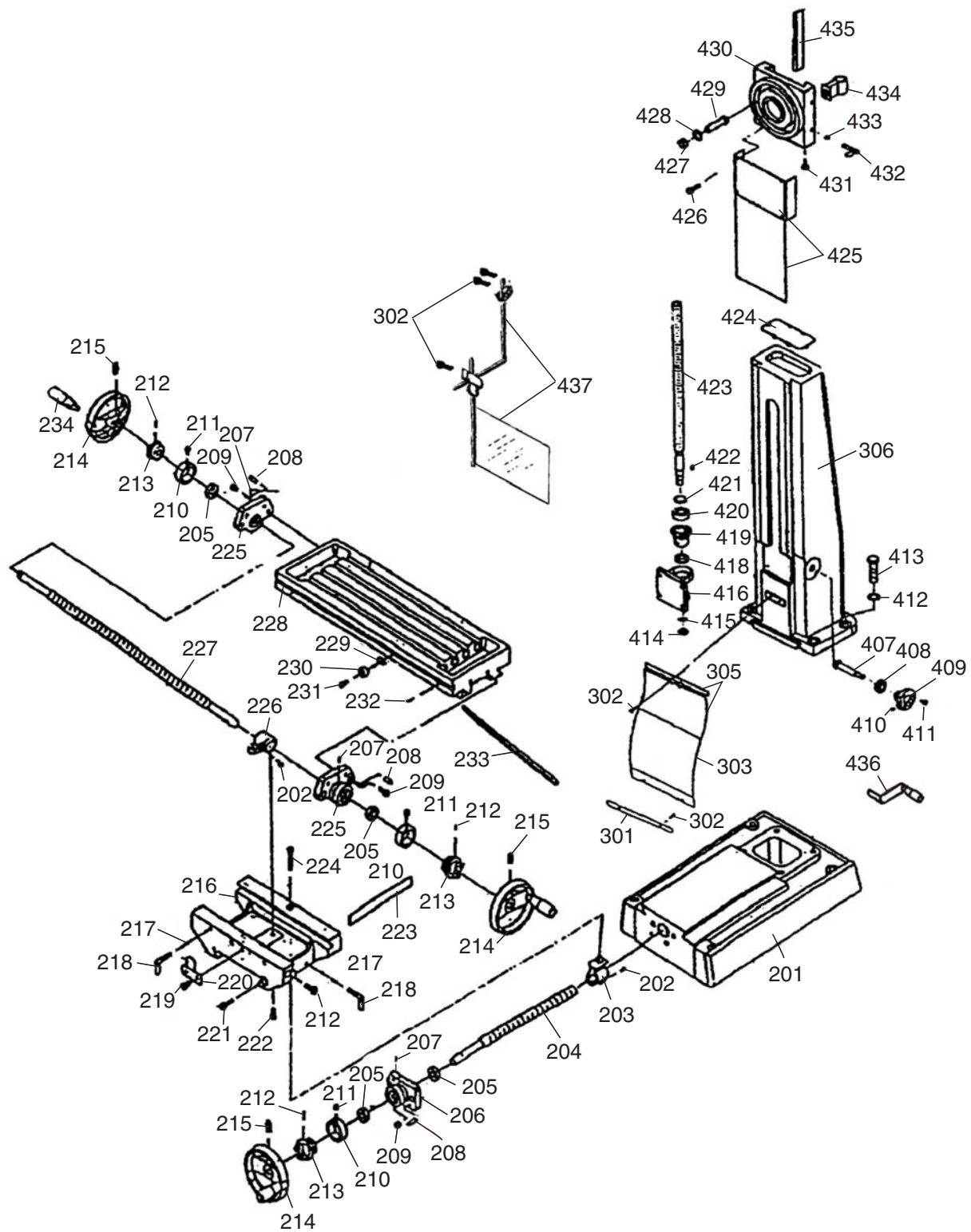


REF	PART #	DESCRIPTION
100	P0519100	CLUSTER GEAR
101	PR07M	EXT RETAINING RING 18MM
102	P0519102	SPACER RING
103	P0519103	DRIVE SHAFT I
104	PK42M	KEY 6 X 6 X 30
105	P0519105	GEAR T-14
106	P0519106	MOTOR 1HP, 220V, 3-PH
106-1	P0519106-1	MOTOR FAN COVER
106-2	P0519106-2	MOTOR FAN
107	PB32M	HEX BOLT M10-1.5 x 25
108	PK74M	KEY 6 X 6 X 35
109	P0519109	OIL SEAL
110	P0519110	COVER
111	PRP80M	ROLL PIN 10 X 50
112	PSB05M	CAP SCREW M8-1.25 X 50
113	P0519113	BREATHER ASSEMBLY
114	P0519114	OIL SEAL

REF	PART #	DESCRIPTION
115	PR38M	INT RETAINING RING 62MM
116	PR21M	INT RETAINING RING 35MM
117	P0519117	OIL CAP
118	P0519118	DEGREE SCALE
119	PSB03M	CAP SCREW M5-.8 X 8
120	PS17M	PHLP HD SCR M4-.7 x 6
121	PAW06M	HEX WRENCH 6MM
122	PAW05M	HEX WRENCH 5MM
123	PAW04M	HEX WRENCH 4MM
124	P0519124	DRILL CHUCK 1-16MM, JT3
125	P0519125	JT3 X R8 ARBOR
126	P0519126	CHUCK KEY
127	P0519127	FOUR-BIT FLY CUTTER W/BITS
128	P0519128	CARBIDE-TIPPED CUTTER BIT
129	PSB28M	CAP SCREW M6-1 X 15
130	P0519130	COMBO WRENCH 24MM



Base and Column Parts Breakdown

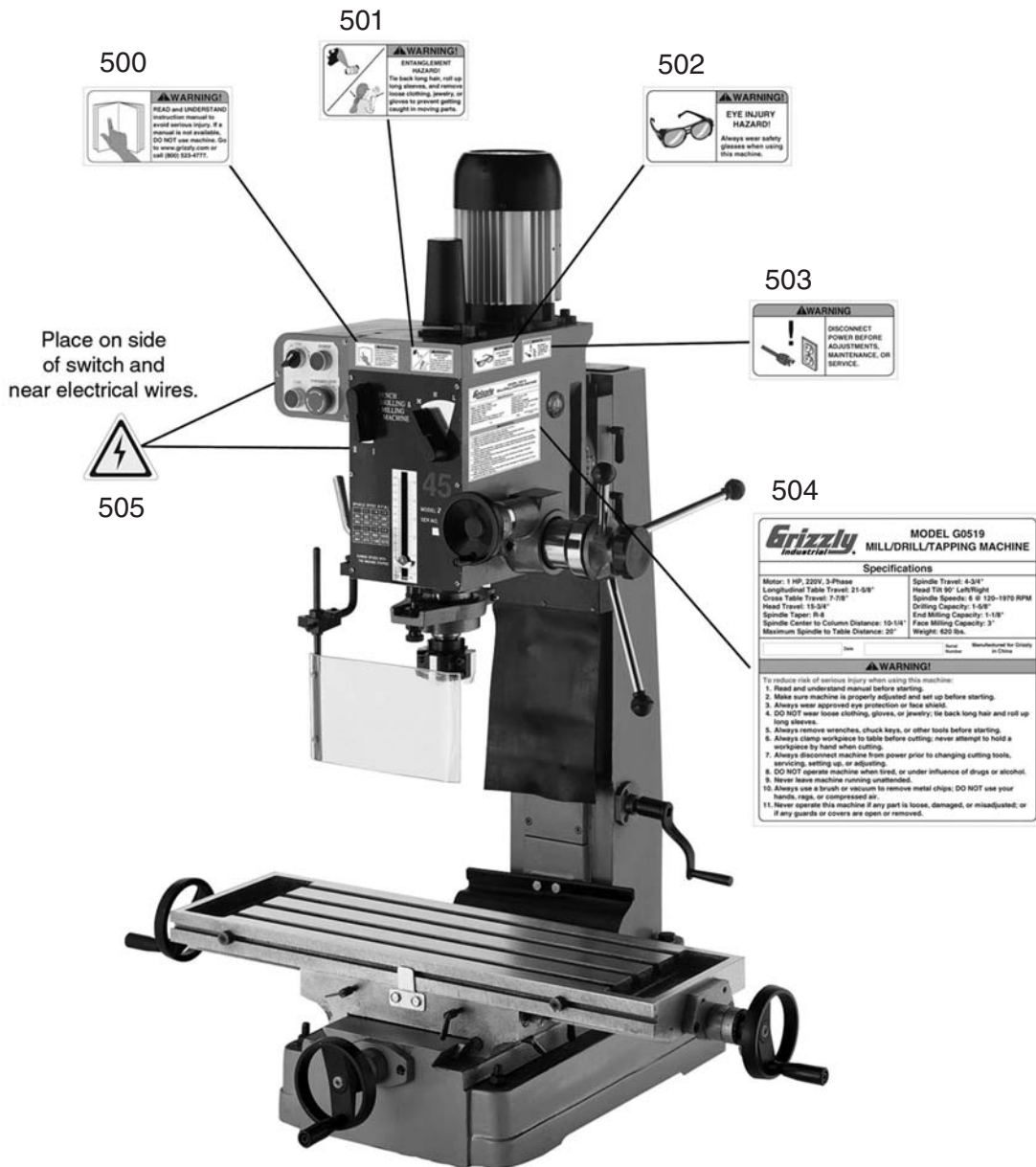


REF	PART #	DESCRIPTION
201	P0519201	BASE
202	PB107M	HEX BOLT M5-.8 X 12
203	P0519203	HALF NUT
204	P0519204	LEAD SCREW
205	P51103	THRUST BEARING 51103
206	P0519206	LEAD SCREW SUPPORT
207	P0519207	BALL OILER
208	P0519208	TAPER PIN 5 X 50
209	PB09M	HEX BOLT M8-1.25 X 20
210	P0519210	SCALE PLATE
211	P0519211	KNURLED KNOB
212	PRP30M	ROLL PIN 5 X 50
213	P0519213	CLUTCH
214	P0519214	HANDWHEEL
215	PSB68M	CAP SCREW M6-1 X 8
216	P0519216	SADDLE
217	P0519217	STEEL BALL
218	P0519218	LOCKING LEAF SCREW
219	PSB58M	CAP SCREW M8-1.25 x 12
220	P0519220	STOP BRACKET
221	P0519221	GIB SCREW M8 X 35
222	PSB31M	CAP SCREW M8-1.25 X 25
223	P0519223	GIB
224	PB166M	HEX BOLT M8-1.25 X 50
225	P0519225	LEAD SCREW SUPPORT
226	P0519226	HALF NUT
227	P0519227	X-AXIS LEAD SCREW
228	P0519228	TABLE
229	P0519229	T-NUT M6-1
230	P0519230	STOP BOSS
231	PB02M	HEX BOLT M6-1 X 12
232	P0519207	BALL OILER
233	P0519233	GIB
234	P0519234	HAND CRANK
301	P0519401	BACKING PLATE

REF	PART #	DESCRIPTION
302	PB06M	HEX BOLT M8-1.25 X 12
303	P0519403	RUBBER SHEET
305	P0519405	PROTECTION PLATE
306	P0519406	COLUMN
407	P0519407	GEAR SHAFT
408	P51102	THRUST BEARING 51102
409	P0519409	PINION HUB
410	P0519207	BALL OILER
411	PB83M	HEX BOLT M6-1 X 16
412	PW08M	FLAT WASHER 16MM
413	PB80M	HEX BOLT M16-2 X 55
414	P0519414	SPANNER NUT M16
415	P0519415	TAB WASHER
416	P0519416	LIFT HOUSING
418	P51103	THRUST BEARING 51103
419	P0519419	GEAR T-24
420	P6204	BALL BEARING 6204ZZ
421	PR09M	EXT RETAINING RING 20MM
422	PK147M	KEY 6 X 6 X 18
423	P0519423	GUIDE SCREW
424	P0519424	COLUMN NUT
425	P0519425	DUST COVER
426	PSB17M	CAP SCREW M4-.7 X 10
427	PN13M	HEX NUT M16-2
428	PLW10M	LOCK WASHER 16MM
429	PB80M	HEX BOLT M16-2 X 55
430	P0519430	HEADSTOCK SADDLE
431	PSB02M	CAP SCREW M6-1 X 20
432	P0519432	LOCK HANDLE
433	P0519433	STEEL BALL
434	P0519434	COLUMN NUT
435	P0519435	GIB
436	P0519436	HAND CRANK
437	P0519437	SHIELD ASSEMBLY



Labels Breakdown & List



REF	PART #	DESCRIPTION
500	PLABEL-12B	READ MANUAL LABEL
501	PLABEL-55B	ENTANGLEMENT HAZARD LABEL
502	PLABEL-11C	SAFETY GLASSES LABEL

REF	PART #	DESCRIPTION
503	PLABEL-62B	DISCONNECT 110V LABEL
504	P0519504	MACHINE DATA LABEL
505	PLABEL-14	ELECTRICITY LABEL

WARNING

Safety labels warn about machine hazards and ways to prevent injury. The owner of this machine **MUST** maintain the original location and readability of the labels on the machine. If any label is removed or becomes unreadable, **REPLACE** that label before using the machine again. Contact Grizzly at (800) 523-4777 or www.grizzly.com to order new labels.



Notes





WARRANTY CARD

Name _____
Street _____
City _____ State _____ Zip _____
Phone # _____ Email _____ Invoice # _____
Model # _____ Order # _____ Serial # _____

The following information is given on a voluntary basis. It will be used for marketing purposes to help us develop better products and services. **Of course, all information is strictly confidential.**

1. How did you learn about us?

_____ Advertisement _____ Friend _____ Catalog
_____ Card Deck _____ Website _____ Other:

2. Which of the following magazines do you subscribe to?

_____ Cabinet Maker	_____ Popular Mechanics	_____ Today's Homeowner
_____ Family Handyman	_____ Popular Science	_____ Wood
_____ Hand Loader	_____ Popular Woodworking	_____ Wooden Boat
_____ Handy	_____ Practical Homeowner	_____ Woodshop News
_____ Home Shop Machinist	_____ Precision Shooter	_____ Woodsmith
_____ Journal of Light Cont.	_____ Projects in Metal	_____ Woodwork
_____ Live Steam	_____ RC Modeler	_____ Woodworker West
_____ Model Airplane News	_____ Rifle	_____ Woodworker's Journal
_____ Modeltec	_____ Shop Notes	_____ Other:
_____ Old House Journal	_____ Shotgun News	

3. What is your annual household income?

_____ \$20,000-\$29,000 _____ \$30,000-\$39,000 _____ \$40,000-\$49,000
_____ \$50,000-\$59,000 _____ \$60,000-\$69,000 _____ \$70,000+

4. What is your age group?

_____ 20-29 _____ 30-39 _____ 40-49
_____ 50-59 _____ 60-69 _____ 70+

5. How long have you been a woodworker/metalworker?

_____ 0-2 Years _____ 2-8 Years _____ 8-20 Years _____ 20+ Years

6. How many of your machines or tools are Grizzly?

_____ 0-2 _____ 3-5 _____ 6-9 _____ 10+

7. Do you think your machine represents a good value?

_____ Yes _____ No

8. Would you recommend Grizzly Industrial to a friend?

_____ Yes _____ No

9. Would you allow us to use your name as a reference for Grizzly customers in your area?

Note: We never use names more than 3 times.

_____ Yes _____ No

10. Comments:

CUT ALONG DOTTED LINE

FOLD ALONG DOTTED LINE



Place
Stamp
Here



GRIZZLY INDUSTRIAL, INC.
P.O. BOX 2069
BELLINGHAM, WA 98227-2069



FOLD ALONG DOTTED LINE

Send a Grizzly Catalog to a friend:

Name _____

Street _____

City _____ State _____ Zip _____

TAPE ALONG EDGES--PLEASE DO NOT STAPLE

WARRANTY AND RETURNS

Grizzly Industrial, Inc. warrants every product it sells for a period of **1 year** to the original purchaser from the date of purchase. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, accidents, repairs or alterations or lack of maintenance. This is Grizzly's sole written warranty and any and all warranties that may be implied by law, including any merchantability or fitness, for any particular purpose, are hereby limited to the duration of this written warranty. We do not warrant or represent that the merchandise complies with the provisions of any law or acts unless the manufacturer so warrants. In no event shall Grizzly's liability under this warranty exceed the purchase price paid for the product and any legal actions brought against Grizzly shall be tried in the State of Washington, County of Whatcom.

We shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special, or consequential damages arising from the use of our products.

To take advantage of this warranty, contact us by mail or phone and give us all the details. We will then issue you a "Return Number," which must be clearly posted on the outside as well as the inside of the carton. We will not accept any item back without this number. Proof of purchase must accompany the merchandise.

The manufacturers reserve the right to change specifications at any time because they constantly strive to achieve better quality equipment. We make every effort to ensure that our products meet high quality and durability standards and we hope you never need to use this warranty.

Please feel free to write or call us if you have any questions about the machine or the manual.

Thank you again for your business and continued support. We hope to serve you again soon.

grizzly.com

TOOL WEBSITE

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